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**THE NEW SYDENHAM
SOCIETY.**

INSTITUTED MDCCCLVIII.

VOLUME LXI.

James C. White.
From Dr. Sig.

ON

January 14, 1875.

DISEASES OF THE SKIN,

INCLUDING THE

EXANTHEMATA.

BY

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THE NEW SYDENHAM SOCIETY,
LONDON.

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TRANSLATOR'S NOTE.

Dr. KAPOSÍ is now associated with Prof. HEBRA in the task of continuing the work commenced by the latter, and has written the greater portion of the present volume. He has also revised the proof-sheets of our translation, and made various additions and alterations. The woodcut on p. 284, showing a keloid growth imbedded in a cicatrix, is now published for the first time, being taken from a drawing which Dr. KAPOSÍ sent over on purpose during the progress of the translation.

I have to thank Dr. BULLER for giving me the benefit of the knowledge he gained in a prolonged residence in Germany, and my friends Dr. WOODMAN and Dr. PORT for various suggestions.

The chapters on Rhinoscleroma, Lupus, Leprosy, and Carcinoma, comprising all at present published, are already translated, and in course of being printed.

W. T.

10, FINSBURY PAVEMENT, E.C.

ON

DISEASES OF THE SKIN.

CHAPTER XXIX.

CLASS VI.—HYPERTROPHIÆ CUTANÆÆ.

UNDER this heading, we shall treat of those diseases of the skin which are characterised by a striking increase in the elementary structures which enter into the formation of the general integument: pigment, horny tissue, connective tissue elements, &c.

DIV. I.—PIGMENTARY ABNORMALITIES.

The literature of antiquity furnishes us with scant material in relation to the abnormal occurrence of pigmentation in the human skin. It is evident, from the writings of Hippocrates, Aristotle, Galen, Dioscorides, Rhazes, Paul of Ægineta, and Pliny, &c., that the coloration of the epidermis peculiar to the different races of men, as well as the pigmentation dependent on the influence of the sun's heat and of light, and also, lastly, the pigmented spots met with in pregnancy and in connexion with general diseases, were known to these writers and to their contemporaries, and were described by them under the names *έφηλιδες*, *Chloasma* and *Melasma*. They, however, only gave attention to these occurrences in so far as they sought to find out the original causes of such abnormal changes in colour, which they then believed they had discovered in the altered constitution of the various humours, and, especially, in the different mixing of the bile or in an inspissation of the juices, though they also represented them as a kind of scorching or charring by the sun, or as a consequence of an internal action of heat, &c.

Celsus, in Book vi. chap. 5, under the head of "De Varis, Lenticulis et Ephelide," treats of these diseases in a very superficial manner, when he says, "pene ineptiæ sunt curare varos; et lenticulas et ephelides."

Besides these lenticulæ and ephelides, he also mentions a rarer form of reddish and uneven freckles which the Greeks call *φακός*. He is further of opinion that the kind which was called by the Greeks *έφηλιδες* was recognised by very few. He defines it in the following way: "ephelis . . . nihil est nisi asperitas quædam et durities mali coloris."

From the "ephelides," which only occur on the face, he distinguishes the "lenticulæ," inasmuch as the latter are frequently also met with on other parts of the body. On the whole, it appeared to him unnecessary to treat of the disease in detail. Nevertheless he recommends various remedies for freckles which we will mention later.

These very imperfect statements of Celsus concerning the anomalies of pigmentation are repeated by the writers of antiquity and of the middle ages, and even by Lorry; for the latter also still makes a distinction between lentigines and ephelides, since he says that the latter occur only in summer, are limited to the face and hands, and are found only in young people; whilst the lentigines occur at any season of the year, on different regions of the body, and only in those individuals who have red or golden-coloured hair.

We find that Plenck makes a similar separation of the pigment spots into lentigines and ephelides. He defines the lentigines as brown spots of the size of lentils, whilst he also designates the ephelides as brown spots, but of larger dimensions, and occurring either singly or in groups. He recognises five kinds of ephelides—*Ephelis solaris*, *Ignealis*, *Gravidarum*, *Hepatica*, and *Neonatorum*.

The founders of the new dermatology, Willan and Bateman, opposed this separation into lentigines and ephelides, grouped under the term ephelides all forms of acquired pigmentation, and retained for the congenital forms, only, the old term *nævus pilus*. The disease of the skin, which until their time was confused with the pigment spots and which Sennert called *Macula hepatica*, they distinguished from the pigment diseases we are now considering and gave it the name of *Pityriasis*

versicolor, in addition to which they spoke also of a Pityriasis nigra. It is especially noticed by these authors that the spots of pityriasis versicolor are not situated, like freckles, on parts exposed to the sun, as the face and hands, but by preference on portions of skin which are usually covered.

Alibert, in the first system of diseases of the skin published by him, established a special class of "Ephelides," which he distinguished as, (1) *Ephelide lentiforme*, with the subdivisions solaire and ignéale; (2) *E. hépatique*, with the subdivisions persistante and fugitive; (3) *E. scorbutique*, with the subdivisions scorbutique noire (*nigro-maculata*), and panachée (*variegata*).

In the revised system which appeared later, the pigment spots are placed in the 11th class of skin diseases, as Dermatoses dyschromatosæ, and he designates them by the term Pannus (*Hautfleck*), of which he distinguishes four kinds, (1) *Pannus lenticularis* (*tâches de rousseur*, freckles); (2) *P. hepaticus*, concerning which he especially remarks that they are not produced by diseased changes in the liver, but only take the name of liver spots because their colour has a resemblance to that of the liver; (3) *P. melaneus* (*tâches de mort*), synonymous with the designation nigredines of other authors, produced by a deposit of a melanotic material in the skin; (4) *P. Karateus* (*Karatafleck*), a disease indigenous among negroes, mulattos, and whites, in hot countries, particularly those adjacent to the Cordilleras, and especially New Grenada.

The French physicians, from Bielt down to the present time, and especially Cazenave, Schedel, Rayer, Gibert, Devergie, and Chausit, define and describe the pigmentary changes recognised under the names of Ephelides, Lentigines, and Chloasmata, in the manner hitherto customary, and consider them identical with, and of equal significance to, pityriasis versicolor. It is, therefore, comprehensible that one described the lentigines, another the chloasmata, a third the ephelides, at one time as acute and transitory in their course, at another time as constant and persistent appearances of the general integument, since they had arrived at no clear perception from their own observations.

The English physicians, who, like their French colleagues, confused ephelides, lentigines, chloasma, melasma, and pityriasis versicolor with one another (*pêle mêle*), are in no better position as regards a knowledge of this skin disease, and, as

is evident in the special works of Anthony Todd Thompson, Jonathan Green, Hillier, Fox, &c., were satisfied with the construction of new nomenclatures. Erasmus Wilson is no exception to this rule, as he, for example, subdivides chloasma into pigmentary, erythematous, furfuraceous, and pruriginous.

The older German authors, also, do not show any advance in this respect, for we do not find any observations noted by the most celebrated among them—Frank, Fuchs, Riecke, &c.—accurately corresponding to the natural processes. The first considers lentigines as sometimes a congenital, sometimes a “leprous” (*aussatzartige*) disease, and sometimes due to the influence of fire and sun, and classifies the lentigines accordingly as *L. nævus* (*Linsenmal*), *L. leprosa* (*Aussatzflecken*), *L. æstiva* (*Sommersprossen*), and *L. ab igne*, brown spots which appear in persons who are in the habit of sitting too near the fire, or which occur in women (huckstresses) who are in the habit of sitting over glowing embers. The latter variety of lentigines, according to him, is observed on the shins and thighs in the form of dark yellow spots, which are stalked and often prominent.

As another kind of abnormal pigmentation, Frank cites chloasma (liver spots), which he defines as yellowish green, and very often smooth, or occasionally somewhat uneven, brown patches as large as the palm of the hand. His subdivision of these liver spots is interesting. He enumerates three kinds. The first is a consequence of pregnancy, the second a consequence of bad juices, and the third a consequence of the use of cosmetics. (?)

Fuchs distinguishes two kinds of pigmentary diseases. These are *Lentigo*, with the subdivisions, *L. ephelis*, and *perstans*, synonymous with *Phakos* and *Ephelis* of Celsus, *Ephelis lenticularis* of Willan, and *Pannus lenticularis* of Alibert; and, secondly, *Chloasma*, with the subdivisions, *Chloasma vulgare*, synonymous with *Maculae hepaticæ*, Sennert, *Pityriasis versicolor*, Willan, *Pannus hepaticus*, Alibert; chl. *uterinum* and chl. *endemicum*.

A sure foundation for the distinction of the patches caused by pigmentary abnormalities of the skin, from those due to the growth of a fungus, was first of all afforded when Eichstädt,* in Greifswald, in 1846, showed that in the disease of the skin called by Willan *Pityriasis versicolor* (by older authors known

* Neue Notizen, &c., von Froriep, Weimar, 1846, 39 Bd., p. 270.

as *Pannus hepaticus*, *Chloasma hepaticum*; by others, *Ephelis* or *Lentigo*), a fungus was constantly present; so that, now-a-days, it no longer appears allowable to consider chloasma and pityriasis versicolor as the same skin disease.

Nevertheless, still more recent and, otherwise, very trustworthy authors are not free from this confusion of lentigo, chloasma, and pityriasis versicolor. As, for instance, G. Simon, who, though aware of the vegetable nature of pityriasis versicolor, yet treats chloasma and pityriasis versicolor as synonymous.

Even the most recent dermatological publications of Dr. A. Kleinhaus, which appeared in the years 1864 and 1866, contain many errors in connexion with this subject; so that he, for example, in the work of 1866, under the head of 'Parasitic Patches,' cites "pityriasis versicolor, pityriasis nigra, liver spots and chloasma, or macula gravidarum."

We will now, for our part, seek to introduce order into this chaos by a description, which shall be true to nature, of the pigmentary abnormalities observed on the skin.

The pigment patches, which are distinguished from the normal colour of the skin by a darker colouring, are either to be regarded as idiopathic affections of the skin, or else they appear in consequence of, or as the product of, various processes, which are partly known and partly conjectural, in individual systems and organs of the body.

As we have, here, only to deal with abnormal pigmentary formations, those belonging to the different races of men, Mongols, Ethiopians, &c., will not be further noticed. We must, however, mention that the pigmentation of the skin in the Caucasian race, whether it be of an idiopathic or symptomatic nature, has been proved, both in regard to the elements of which it consists, as well as its localisation, to agree with that observed in other races of men. So, also, the pigmented and pigmentless parts of the skin of the lower animals are of the same nature as the corresponding parts of the human skin.

Whether the pigment is physiological or pathological, it is not met with as a dark-coloured fluid, or solid, confined in (special) cells, but in the form of pigment molecules lying in ordinary epidermic cells, and therefore the pigment of the skin is always mechanically connected to the horny tissue.

If dark-coloured, and even black masses, which also receive the name of pigment, are found in other layers of the general integument, in the connective tissue, or in new formations, such differ remarkably from that present in the horny tissue, and are, therefore, neither to be confused with it nor to be considered further in this place. The true pigment patches of the skin are generally characterised by their giving to it a pale yellow or black colour, by the surface appearing, for the most part, smooth, but occasionally uneven and covered with hairs; and by the fact that it does not suffer desquamation or other form of efflorescence, and remains for a long time almost unchanged.

Further, it must be noted that abnormalities of pigmentation are observed in new-born children, and may also make their appearance at any period of life in various parts of the skin and under many forms. The first is known as *congenital*, the latter as *acquired* pigmentation. The congenital pigmentary changes are called Nævi (Moles), and are either met with merely as abnormal collections of pigment in the epidermis without further proliferation of the latter, or are co-existent with raised, warty, tubercular protuberances. In the first case, they take the name of *nævus spilus* (*Fleckenmal*), and, in the second, that of *nævus verrucosus* (*Linsenmal*).

If we compare the great number of *nævi spili* (*Fleckenmale*), and of *nævi verrucosi* (*Linsenmale*), observed in grown-up persons, with the small number of such pathological formations usually seen in new-born infants, it is clear that the term *nævus* is greatly misused. In other words, the congenital pigmented moles are of rare occurrence, the more frequent ones being those which originate later in life. My opinion is that it would be well to discriminate between these, and only to regard those pigmentary changes as *nævi* which are actually observed on the skin of the new-born infant. For, these are distinguished by objective symptoms from the acquired, since the congenital are, for the most part, present over a larger extent, or may be arranged in a manner resembling that of Zoster: for instance, they may occupy a third part of one-half of the circumference of the chest, or may stretch for a considerable distance, along the course of a nerve on one of the extremities; moreover, they are of deeper colour, covered with hairs, and elevated above the level of the skin. They grow also,

for the most part, with advancing age. The acquired nævi, on the contrary, are lentil-shaped, are dispersed mostly on the back, but also on the extremities and the nape of the neck, and grow no more after they have once attained the modest dimension of a large lentil.

In reference to the acquired abnormalities of pigmentation, that is, those originating in the course of extra-uterine life, we must consider the variation of colour, of form, and appearance.

The colour varies between yellow, yellowish-brown, dark brown, black-brown, and blackish grey, and, even in cases of the darkest coloration, does not originate from *black* pigment, but only from an accumulation of the ordinary skin-pigment taking place at that part.

The size of the papules varies from that of a pin's head to that of a lentil. They are mostly situated at the mouths of the hair follicles, and may be at one time disseminated and at another aggregated nearer together. We may also find these pigment changes in patches the size of half-a-crown, or of the palm of the hand, or larger, spread over large tracts of skin. They are called lentigines or chloasmata according as they resemble a lentil in form and size, or are of larger dimensions.

A. *Lentigines.*

We would class under this term, all those pigmentary changes which are usually met with on the face and on the arms, but also on other parts of the surface of the skin, in the form of spots of the size of a pin's head or lentil, and of a yellow or yellowish-brown colour. To make a distinction between *Lentigo perstans* and *Lentigo ephelis*, as Fuchs, following the example of the older authors, has done, is impracticable, because *L. ephelis* has no existence. Since it is a fact that lentigo neither appears in the newly-born nor in children under the age of 6 to 8 years, whether they run about the whole day in the open air and exposed to the bronzing influence of the sun, or whether they remain confined to the darkest room, it is therefore certain that neither light, nor air, nor warmth produces such spots in children.

The name *Lentigo perstans* is most appropriate, on the contrary, to such spots as are habitually met with in older indi-

viduals, from 8 to 40 years of age, because these spots do not, as was supposed, originate only in the summer from the sun's heat (freckles), but remain present throughout the whole year, summer and winter. They certainly, however, show in summer a deeper tint or a darker colour than in winter.

If we examine the skin of an individual, who is said to be affected with the so-called freckles only in the summer, at other seasons of the year, with sufficient closeness, in a good light, and with the skin put on the stretch by the finger, we shall detect the same spots, of the same size, but of somewhat lighter colour than in summer. In further illustration of what has just been said, I will mention that I have repeatedly had the opportunity of seeing lentigines on parts of the body that, as a rule, are never exposed to the influence of light and sun; such, for instance, as the skin of the buttocks, genitals, and penis, which appearances are shown by drawings in my possession.*

Summer spots, in the strictly etymological sense of the term, that is, brown spots which are merely present in the summer, have no existence. Consequently, all such pigment changes may be designated by the term lentigines.

A priori, it is difficult to understand how ephelides can originate from the influence of sun and light in the singular form of disseminated spots, since these influences act not only on single points, but uniformly over the whole surface of the skin of the face, hands, &c. The pigmentary changes must appear, therefore, in the form of patches, not of points. Moreover, it is known to everyone that if the skin of the face be directly exposed, even for only a short time, to a rough wind or to intense heat, a tolerably dark bronzing appears, which invades the affected parts uniformly, and not in the form of disseminated, so-called, summer spots (freckles). It was, therefore, only faulty observation on the part of our forefathers which induced them to attribute the ephelides to the influence of light and sun.

If, however, it is proved that the so-called summer spots are not mere products of the summer season, then the name of summer spots, or ephelides, applied to the pigment patches described, must, logically, be given up, and the term lentigines (*Linsenflecke*) be used for them instead.

As already remarked, these pigmentary changes never appear

* See Hebra's Atlas, 8 Lief.

before the eighth year of life, mostly becoming manifest first, between the ages of 8 and 40, and are often no longer to be seen later in life, say, after 40 years of age. They are relatively most frequently met with in red-haired individuals; nevertheless they occur pretty often in persons of blonde and brunette complexions.

B. *Chloasma* (*Ephelis hepatica*, *Leberfleck*).

Alibert has already rightly remarked that the name liver spot was not chosen for certain spots on the skin, because diseases of the liver caused such pigmentary changes, but, solely, on account of the similarity of the colour of these maculæ to that of the liver.

The chloasmata appear in the form of yellow or yellowish-brown patches of the size of the palm or of the whole hand, or larger, and of various shapes, situated on widely different regions of the body, but, for the most part, on the face and trunk, and less frequently on the extremities, and more or less circumscribed and sharply defined.

The surface is neither covered with scales, nor does it undergo change in any way from scratching. By the latter circumstance, it is essentially distinguished from the disease bearing the name of Pityriasis versicolor—a yellowish-brown discoloration of the skin, well known to be due to the formation of a fungus, and in which, by scratching with the finger-nail, one can at any time remove the uppermost layers of the epidermis in the form of branny scales and membrane-like lamellæ. It is, therefore, wholly inadmissible to consider chloasma and pityriasis versicolor identical, as many authors do.

If we name all acquired pigmentary changes of the skin Chloasmata, we must further divide the same into *idiopathic* and *symptomatic*. The idiopathic are, further, partly *artificial* pigment changes caused by irritation of the skin, partly *concomitant*, that is, pigmentary changes occurring subsequently to and in consequence of other skin diseases, and, finally, partly *spontaneous* patches, arising without further known cause. The symptomatic occur in consequence of sexual or uterine affections as the so-called *chloasma uterinum*, *gravidarum*, *hystericum*, and partly as diffused pigmentary changes, which occupy sometimes even the

whole surface of the skin, and are due to cancerous disease and other general maladies. Here, finally, may be reckoned the pigmentary disease of the skin known under the name of *Morbus Addisonii*.

IDIOPATHIC* ACQUIRED PIGMENT PATCHES (*Chloasma idiopathicum*).

Pigmentation of the epidermis may result from any lasting irritation of the skin, and may be preceded by mere hyperæmia of the irritated skin, or by exudation or hæmorrhage, but it may also occur without any redness and swelling of the skin having taken place previous to the pigmentation. The latter appears as the first permanent result of a given irritation of the skin.

As the irritation of the skin may be either of a mechanical, traumatic origin, or of a chemical nature, or due to heat, we distinguish the pigmentations caused by irritation of the skin as either *traumatic*, or *toxic*, or *caloric*.

a. *Chloasma traumaticum*.

It is well known that, in consequence of long existing pressure on the skin, or in consequence of a blow or of a crush, pigment spots remain behind after the changes in the skin, due immediately to the injury, the redness, swelling, hæmorrhage, &c., have long passed away. Various large and small brownish spots indicate to us those parts where the clothes have fitted tightly to the skin and have exercised pressure and friction, such as occurs from the pressure of stays, braces, garters, straps, pads of trusses, belts, &c., or from the pressure on the skin over the tuber ischii, to which people following certain employments, &c., are subject. A further very efficient agent in the production of pigmentary changes is the frequent and severe scratching of the skin, by means of the finger-nails, customary in persons affected with pruriginous skin diseases, so that, thus, a whole series of peculiarly formed and characteristically arranged and localised pigmentary changes owe their production simply to scratching with the finger-nails.

That this intimate connexion between pigmentation of the skin and scratching of the same actually exists, can undoubtedly

* See p. 312, vol. i.

be proved by the observation of cases of this sort; for, in all diseases of the skin attended with itching, and therefore with scratching, the pigmentary changes at their commencement agree in direction and locality with the excoriations, and become later more marked and, at the same time, more widely diffused and less defined in shape, in proportion to the longer duration and increasing severity of the pruriginous disease. For this reason, we find, almost invariably, that in persons who have suffered severely, for a long time, from *pediculi vestimentorum*, there exists a dark pigmentation of the skin, sometimes almost passing into a greyish-black discoloration, which is most marked just on those parts on which the clothes' lice are accustomed to lodge in the greatest numbers; such as in the region of the nape of the neck and of the loins, in which parts the linen and clothes make many folds and fit tightly.

In patients suffering from prurigo, we see the skin of the lower extremities pigmented chiefly on the extensor, less so on the flexor surfaces, and not at all on the flexures of the joints. In the milder forms of prurigo, there is a slight, and in the severer, an intense, pigmentation.

A precisely similar relation may be shown to exist between the pigmentation met with in scabies and the portions of skin which are repeatedly and severely scratched.

b. *Chloasma toxicum*.

We find a second series of pigmentary changes in the skin caused by the action of substances which we are accustomed to apply as remedial agents. One application of a mustard plaster is sufficient to produce a corresponding pigmentary mark for life; an occurrence certainly not unimportant if the part involved be the bust or arm of a lady, and which in other persons is at any rate unnecessary if one bears in mind the exceedingly problematical efficacy of a mustard plaster in any disease whatever. The dark pigment patches which vesications cause on the skin are indelible; nevertheless, ophthalmic practitioners have not yet discontinued the practice of applying blisters in continual succession on the forehead, over the eyebrows, and in the region of the mastoid process, &c.

If we bear in mind that all the diseases in which vesicants

and the allied, so-called derivants are recommended, may also take a favourable course without such irritation on the skin, and that, objectively considered, their progress is not affected by these irritative remedies; if we recollect, also, that there is no scientific foundation for, or proof of, the exercise of any influence by excitants applied externally, on processes set up internally; and, on the contrary, that it is well established that such irritation of the skin often leaves pigment patches for the remainder of life, for the removal of which we do not possess remedies, then we shall be convinced we are only doing our duty if we abstain from the application of such irritation of the skin, and also, so far as our sphere reaches, discountenance and prevent the adoption of such treatment.

c. *Chloasma caloricum*.

It is the general opinion that only increased heat, especially the heat of the sun, can develop a deeper pigmentation of the skin. But, unprejudiced observation will soon teach anyone that a low atmospheric temperature, if it act for a longer time on uncovered parts of the skin, may cause them to become more darkly pigmented. Not only persons who expose their faces to the direct heat of the sun become bronzed, but also those who are much exposed to the influence of a low temperature, even under 0° (32° F.) in the open air.

The characteristic feature of all these kinds of bronzing consists, not in their colour but in their localisation, since the darker colour is only met with in those parts of the skin exposed uncovered to the above-mentioned influences, and is there equally diffused, whilst it is wanting on adjacent parts which have been covered; for, one finds in these sort of cases that the skin of the whole of the face, including that of the auricles of the ears and of the neck, as low as the level where the shirt-collar usually lies, is uniformly coloured of a dark tint; similarly, the skin of the hands and of the forearms as high as the bends of the elbows, where the turned-up sleeves lie; the skin of the middle of the breast, and over the pit of the stomach; of the feet and legs as high as the knees, &c., may be affected in coachmen, soldiers, sailors, road and field labourers, bricklayers, stonemasons, watermen, vine-dressers of both sexes, &c. This peculiar localisation of

the pigmentation, which terminates at the portions of skin which, as a rule, are covered by the clothes, distinguishes it plainly from those due to internal causes, as, for example, the pigmentary changes proceeding from alterations in the sexual organs.

Moreover, if it is certain that the influences mentioned can occasion a deeper pigmentation of the skin, still we must not forget the circumstance that the production of such discoloration is influenced not only by the proximate cause, that is, exposure to the air and heat, but also by a remote cause—the actual state of health of the individual at the time.

It is well known that many individuals can be exposed to the greatest heat of the sun without becoming bronzed, or at least markedly so, but retain their pale complexions. This applies to chlorotic and tubercular subjects. On the contrary, these same individuals become bronzed so soon as they are exposed to the above-named external influences if, in course of time, they recover from their constitutional affection.

It is frequently said in ordinary modes of speech, “I easily become bronzed, or I become bronzed with difficulty.” The scientific commentary on this mode of speech would be, “healthy people bronze easily, sick people only with difficulty, and slightly.” Something analogous to this is met with in Pellagra, a disease which arises solely from the influence of the sun’s heat as the proximate cause, and then only when a defective state of the general nutrition co-operates as a remote cause.

SYMPTOMATIC ACQUIRED PIGMENTARY CHANGES (*Chloasma symptomaticum*).

Dark-coloured, and sometimes very large patches of pigment change, either confined to a single region of the body, or distributed over the whole surface of the skin, are met with in connexion with various well known, as yet inexplicable, organic diseases. Amongst the great number and variety of these, we will only here describe a few which have frequently come under our observation.

a. *Chloasma uterinum*.

Though recent and even gynæcological writers bestow little attention on this disease, and even in part, marvellous to state,

confound these patches with pityriasis versicolor, yet, nevertheless, the existence of uterine chloasma as a special disease, consisting in anomalous pigmentation of the skin, is established and confirmed by daily observation.

In order that we may proceed in our description in anatomical order, we remark, in the first place, that we sometimes meet with a brownish pigmentation on the face, in females, which extends over the whole forehead as high as the level of the hairy scalp, and is either of a uniformly yellow or dark brown colour, or presents isolated, paler spots here and there. The latter, the streaks, do not always take a horizontal course corresponding with the wrinkles on the forehead, but are not infrequently oblique, irregular, scattered here and there, or run from one frontal eminence to the other.

In other cases, the dark pigmentation is confined to two symmetrical patches between which the skin remains of normal colour. They frequently arch over the eyebrows. Another time, the skin of the upper or lower eyelid is tinted a peculiar brown, whereby the whole countenance obtains the expression of sickness or suffering. Sometimes, such a brown pigmentation passes in a linear direction outwards for a certain distance from the outer canthus, like a continuation of the palpebral fissure.

In the same way, we meet with the brown patches, in other persons, on the skin of the cheeks, on the upper and lower lip, and in the sulcus mentalis, but the parts of the face not mentioned, the nose, the cheeks, &c., do not always remain entirely free from pigmentation.

In many persons, the whole of the skin of the face is covered with a dark chestnut-brown discoloration, which extends to the neighbourhood of the angle of the lower jaw. On the other hand, the skin of the ears and of the neck, under the chin, always remains exempt from pigmentation, and in such cases the lighter colour of these portions forms a very striking contrast.

Of the remaining parts of the body, the areola round the nipple and the linea alba are those which are especially liable to such pigment patches and streaks.

That all these pigmentary changes are caused by certain physiological and pathological changes in the female sexual

organisation may be inferred from the fact that they never make their appearance before the time of puberty, that, in many persons, they only appear either before, or during, ordinary menstruation, whilst in others they accompany each pregnancy; that in many such persons actual, manifestly pathological conditions of the internal sexual organs—uterus, fallopian tubes, ovaries—are discoverable, such as profuse or scanty menstruation, ovarian tumours, uterine fibroids, infarction, polypi, cancer, &c.; and that, lastly, with the improvement or removal of these conditions the pigmentation also diminishes in its intensity or wholly disappears.

It is true that uterine chloasma is often seen on the face in females who are neither menstruating nor pregnant, nor show signs of any internal genital disorder. Such cases must, however, be regarded in the same light as the innumerable morbid conditions which have long been known under the name of *Hysteria sine materia*. As it is now customary to attribute hemicrania, neuralgias of all sorts, obstipatio and periodical diarrhoea, cardialgia, globus, clavus, &c., to a uterine lesion, without, however, being able to determine the real nature of the disease itself, we must consider ourselves justified, on the strength of the above details and analogy, in referring the pigmentary changes named to a similar origin. He who only considers pregnancy, or demonstrable alteration in the sexual organs of any importance, etiologically, in regard to such pigmentary changes, is just as unable to establish the connexion between the two processes as he who is content with the assertion that the so-called hysteria is the cause of the pigmentary change.

It remains to be noted that all these chloasmata, of the face, of the nipple, and of the abdomen, disappear with the atrophy of the uterus and the physiological involution of the whole of the genital functions; so that we vainly seek for chloasmata after the climacteric period, even when, formerly, such were present in abundance on these particular individuals.

b. *Chloasma cachecticorum*.

Under this name, we will consider those deep discolorations of the general integument which become developed in conse-

quence of various constitutional diseases, and are usually extensive. This occurs especially in connexion with malarial affections, which without exception produce a yellowish or dark chestnut-brown pigmentation. These pigmentary changes last longer than the intermittent fever, and still continue for years after the attacks of the intermittent fever have long ceased to recur.

These discolorations are especially intense whenever external influences, such as the sun's heat and exposure to a brisk breeze, also concur in their production. We therefore find them strongly developed in railway labourers, who throughout the summer months work in malarial districts, with bad food and bad lodging, and in addition, perhaps, harbour a great quantity of clothes' lice. Under these influences, the intermittent fever, the bodily privations, the bad food and lodging, the open air, the severe scratching in consequence of the Itch and of clothes' lice, &c., so dark a pigmentation becomes developed that it is only distinguished from that of a mulatto, at most, by its being less uniform; since the pigmentation is generally wanting in these chloasmata in the flexures of the joints.

The pigmentation caused by cancerous cachexia is of a similar character, whether the new growth be situated in the stomach, in the liver, in the kidneys, or wherever it may be; so that no conclusion can be arrived at, from the localisation of the pigment patches, as to the seat of the cancer. The rarity with which new growths occur in the supra-renal capsules makes it much less justifiable to attribute a peculiar species of pigmentation (*Morbus Addisonii*) to this cause, than to hold that cancer of the liver stands in a special relation to pigmentation of the skin. And, although we are ready to acknowledge that Addison was the first to call attention to disease of the supra-renal capsules in connection with pigmentation of the skin, still we cannot admit the propriety of making a diagnosis of *Morbus Addisonii*; because no one can diagnose the existence of disease of the supra-renal capsules with certainty, in any darkly pigmented individual during life. Addison himself, with great love of truth, has stated, what is proved by his own preparations, preserved in Guy's Hospital, that he saw deep pigmentation originate in individuals who had no disease of the supra-renal capsules; and, on the contrary, found the latter, *post-mortem*, without pigmentation

having been present during life. Addison's followers, therefore, have been more Addisonian than he himself.

Melasma.

Already, in the description of the discolorations known under the name of Chloasma, it has been mentioned that in certain cases the pigmentation deepens to a grey or greyish black. Such patches are then included under the name Melasma, or Negrities cutis, and there appears at the same time on them a kind of fine, branny desquamation, so that they answer to the term Pityriasis nigra, which originated from Willan. This anomaly of pigmentation is chiefly characterised by the fact that the skin never appears uniformly and deeply tinted, but that it only attacks isolated, scattered parts of the body in the form of dark patches, whilst on other parts of the skin, especially in the flexures of the joints, the colour appears less intense. These patches appear, according to the cause of their production, variously interspersed with lighter, or even, quite white spots. In exceptional and rare cases, these artificially produced pigmentations are universal, but, even in these, the skin of the face and of the hands remains lighter than that of the rest of the body.

That in such cases we have not to do with a foreign pigment (Melanosis), but with the usual normal pigment, which is only present here in larger quantity, is shown by this circumstance, that there are always, at the same time, other parts of the skin which are less pigmented, and which contain normal pigment, and partly, also, by observing the development and involution of such pigment patches; during the latter we remark that the intensity diminishes gradually from a greyish black to a light brown. This is most evident in those Melasmata which are caused by local influences, by irritation of the skin, and which disappear after a time, being generally of the deepest tint immediately after the irritation of the skin in question has occurred. The original black colour of the melasma gradually becomes the brown of chloasma, and then undergoes transition to a light brown and pale yellow, till at last it pales to the normal colour of the skin.

We can also distinguish an *idiopathic* and a *symptomatic*

kind of melasma, of which the first arises in consequence of persistent irritation of the skin or of preceding local exudation. Thus it arises in consequence of the effects of scratching, in persons who have long been affected with *pediculi vestimentorum*. Corresponding with the duration of this condition appear, at first, light coloured, later, dark, and, finally, quite black, pigmentary changes, which agree in direction and locality with the excoriations caused by the scratching.

The second kind, the symptomatic melasma, arises in consequence of exudative processes, as, for instance, in Pellagra, and in the epidemic of Acrodynia, which occurred in the year 1828 in Paris, at which time, according to the testimony of Alibert, the skin of those attacked became of a colour resembling that of an unwashed chimney sweeper. We also saw such a dark grey pigmentation in a case of general sclerosis of the skin (*vide* Auspitz, H.; 'Wiener Med. Wochenschrift,' 863, Nr. 47, p. 739).

We see such black pigmentary changes occurring in a partial form, in a few individuals (of the Caucasian race) on the genitals, on the scrotum, and on the greater and lesser labia. Exceptionally, also, such discolorations are said to be seen in isolated spots on the face, especially on the eyelids, as in a case described by Neligan. The circumstance, however, that in Neligan's case the dark colour could be removed by wiping and rubbing would appear to indicate rather, that in this instance the black colour of the spots was caused by an accumulation of sebum, mixed with dirt. It is also known that in ichthyosis the epidermis sometimes acquires a very dark colour, especially in that form which bears the name of *Ichthyosis cornea* or *hystrix*, as is shown by the case represented by Alibert (pl. 38).

In all the last mentioned cases, the dark colour of the epidermis is combined with a coexisting thickening, whereas, in cases of ordinary melasma, the epidermis does not appear to be further changed.

Etiology of pigmentary abnormalities.—It is very evident that the abnormal deep pigmentations of the skin are not always due to the same cause.

With regard to the idiopathic pigmentations, it is known that the various irritations above cited result in a discoloration varying according to their intensity and duration. It was stated

that any injury, whether it consist of pressure, friction, or scratching, as well as the action of toxic and caloric agencies, could develop pigmentation of the skin. Moreover, there are idiopathic pigmentary changes, such as the lentigines, which appear without the antecedent influence of any well-known agent, concerning which it has nevertheless been assumed that they might be produced by the influence of light, air, and heat. That such, however, is not the case has been already discussed, and, on the contrary, it was pointed out that such pigmentary changes are met with in places which are never exposed to the action of the above-mentioned sources of irritation: We would rather attribute the cause of these punctiform pigment spots (Ephelides, freckles) to an original morbid predisposition, which view is certainly not without an anatomical foundation. In relation to this subject, we may be permitted to point to the piebald patches so often met with in the lower animals, in whom various patches producing a piebald appearance become evident on the bare skin, after the hairs or feathers have been removed. In horses, dogs, pigs, &c., we find that the skin is without pigment in places where light-coloured hairs and bristles exist, whilst the dark brown or black hairs correspond to deeply pigmented portions of skin. A similar appearance also occurs in the human subject, of which we will treat later, when we come to speak of circumscribed want of pigment (*Poliosis circumscripta*).

We are, consequently, of opinion that we should regard these idiopathic pigmentary changes of the epidermis as a freak of nature, as in the lower animals (the *lusus naturæ* of our forefathers), as a peculiar grouping of the individual pigment molecules of the skin, rather than as a veritable disease. In short, we would consider the lentigines and ephelides as analogous in their nature and significance to the piebald appearances met with in the lower animals.

That in many cases a peculiar innervation may here come into play results from the consideration of those pigment patches which are arranged like zoster on the skin; for example, they begin at one point of the vertebral column, and either appear as brown streaks extending along an upper extremity, corresponding to a peripheral nerve (ulnar or brachial), or, at another time, span, in a stripe, one-half of the periphery of the thorax,

or of the abdomen, or even mark the skin of the buttock, thigh, and leg with pigment patches, taking the direction of a zoster ischio-femoralis.

Respecting the symptomatic pigmentary changes, which we have mentioned as *chloasma uterinum*, *gravidarum*, *cachecticorum*, &c., we have only to remark here that the same cause does not always produce pigmentation of the same character, nor always in the same locality. Even the position which it may happen to occupy has a marked influence on the lightness or darkness of the pigmentation. Thus, it is a fact that skin tightly stretched over the subcutaneous structures appears of a lighter colour, and corrugated skin of a darker colour. If we stretch a deeply pigmented patch of skin, it will appear of a lighter colour in proportion to the amount of stretching, and *vice versâ*. Henle is of opinion that the darker colour of the skin on corrugation results from the approximation of individual pigment molecules.

Healthy people, as a rule, possess a turgescient skin containing much fluid, and such a skin is tightly stretched, whilst in sick people this turgidity, owing to deficiency of fluid contents, is diminished; thus it becomes evident why healthy people show a clearer colour of skin than do the sick.

Amongst the causes of the congenital pigment patches existing at birth, and which bear the names *Nævus spilus*, *verrucosus*, &c., is also reckoned, popularly, the so-called "fright"* (*Versehen*) of pregnant women. Without in the least doubting the great influence which mental and spiritual affections may exercise on the bodily condition of mankind in general, and on that of pregnant women in particular, still we believe that all the morbid appearances occurring on the skin of a new-born child have been incorrectly attributed to this source. Besides, it is indeed scarcely conceivable, considering the numerous passions and emotions which agitate mankind, and to which pregnant women are certainly not less exposed than others, how, in so comparatively few cases, the child should be born with the supposed consequences of these emotions, *i.e.*, pigment patches, for, amongst a thousand new-born children, only one *nævus* (Mole), at most, is observed.

Therapeutics.—As the pigment is situated in the deeper

* See p. 71, vivid mental impression (fright, &c.) from *looking*.—Tr.

layers of the epidermis and, in fact, in the young layers of the rete Malpighii, our attention must chiefly be directed to the destruction of the pigmented epidermis, and we must observe whether the horny layer subsequently formed, again contains a notable amount of pigment, or whether the latter is absent.

Experience has revealed the remarkable fact, that amongst the numerous remedies we possess which will destroy the epidermis, there are some after the action of which the epidermis subsequently formed contains more pigment than that preceding it, and others, on the contrary, after the application of which the newly produced epidermis contains less pigment than that which was destroyed. To the first, belong spurge-olive (*Cortex mezerei*), croton oil, cantharides, mustard-seed, and sulphuric acid; to the latter, acetic, hydrochloric, and nitric acids, borax, the caustic alkalies and their carbonates, and, above all, corrosive sublimate. It is therefore obvious, that whenever we wish to remove pigment we should use one of the latter remedies only. It has long been known that the alkalies possess the property of destroying and dissolving the horny tissue, and of stimulating the skin to make an energetic renewal of the same; and for this purpose the biborate of soda (borax), and caustic soda or potash, have been used in the form of soaps for washing, cataplasmata, &c.

Used in this way, however, all these remedies act too slowly and feebly to cause the speedy removal of deep-seated pigment, and, on the contrary, owing to the slowness of the whole process set up for the regeneration of the epidermis, too much time is granted for the formation of new pigment. If we wish to remove the epidermis quickly, by means of alkalies, it is necessary to employ more or less concentrated solutions of them in the form of cataplasmata, or of ointments, and to let them act for several hours or days. If cataplasmata—made by dipping pieces of cotton-wool into common spiritus saponatus, or, better still, into our spiritus sapon. kalinus—are applied uninterruptedly for several nights, or, rather, for several days and nights, on the pigmented spots, the part acted on appears, at first, more deeply coloured, and has a smooth and glistening surface; subsequently, the uppermost layers become corrugated, and separate from the deeper epidermic layers in the form of a lamella, and the young epidermic layer,

which is then exposed, appears of a much paler rose-tint than that which existed previously. This manœuvre can be repeated several times, and, in this way, after a longer or shorter period, we shall succeed in either wholly removing the dark pigmentation, or in considerably diminishing it.

Repeated painting of the brown patches of skin with tincture of iodine, in such a manner that the tincture is applied every four hours, for three days, will also kill the uppermost horny layers of the epidermis, and lead to the production of a young cuticle, not at all, or but slightly, pigmented.

As these methods are very troublesome, and cannot be carried out in all cases, a salve composed of equal parts of trisnitate of bismuth and ammonio-chloride of mercury (of each two drachms), with four times the quantity of lard (one ounce), may be applied in appropriate cases, spread on pieces of lint, which are laid on the pigment patches at night at least.

A collyrium, whose chief constituent is corrosive sublimate, and which it is said the ladies of the seraglio employ for the removal of freckles, has long been known, and was spoken of by us, as *aqua cosmetica orientalis*, at p. 297, vol. ii., of this work.

Another collyrium, containing corrosive sublimate, is recommended; it consists of two ounces of emulsion of bitter almonds, two drachms of tincture of benzoin, and half a grain of corrosive sublimate, and its use as a lotion, persisted in for a long time, causes a scarcely noticeable, but continuous, desquamation.

If, however, we wish to remove pigment patches within as short a time as possible, we must make use of a concentrated solution of corrosive sublimate, five grains to the ounce of distilled water, alcohol, or collodion. In order to avoid possible inconveniences and even injury, we proceed with all due precaution, somewhat in the following manner:—Place the patient in bed, prepare compresses closely fitting on the affected parts of the face or of the body, and, after the face, for instance, has been cleansed previously by washing with soap, the soap removed with water, and the face thoroughly dried, we apply the compresses dipped in the above-mentioned fluid, so that they are not creased, but lie firmly and smoothly. We have then to be careful that no stratum of air insinuates itself between the skin and the compresses.

These pledgets are now carefully and continuously kept

uniformly moist; for which purpose we do not now and then remove them and dip them in the fluid, but we make use of a clean dossil of charpie, by means of which we continually re-apply the fluid to the pieces of lint; of course we scrupulously guard against any of the fluid going into the eye, or the nose, or the mouth, or running down the neck, because we should then destroy the epidermis in places where we had no intention of doing so. This dressing is applied uninterruptedly for four hours, during which time, therefore, the pledgets remain *in situ*, and are kept properly wetted with the fluid. When we remove the compresses at the end of the time mentioned, in many cases the epidermis will be seen to be lifted up in large blisters; in others, the skin is merely reddened. In the first case, we prick the blister in order to let out its contents, and to keep its cover, the epidermic layer, still on the skin. Moreover, in any case in which a blister is formed, or the skin merely reddened, we strew a sufficient quantity of starch on the place affected, and then wait patiently for some days till the layer of epidermis which has been raised from its substratum has separated in the form of a brown or black crust. The newly-formed epidermis, which afterwards becomes visible, will assuredly exhibit a lighter and finer colour.

Finally, we will consider the remedy of tattooing, by means of which pigment patches can be concealed, though the experiments made with this object have in no case afforded a fortunate result. If we wish to give a patch of skin a permanent artificial pigmentation by means of tattooing, we bind several fine English sewing-needles firmly to one another, in a bundle, and then, carefully holding their points on the same level, pierce the skin, and immediately withdraw them. The punctures thus made lie so near to one another that their circumferences almost touch. We remove the few drops of blood which are sure to trickle out of the punctures with a sponge, and then rub a colouring material into the skin, which is now becoming somewhat swollen after the pricking. When we wish to introduce an intensely red colouring material (as, for instance, cinnabar, carmine, red lead), or even indigo, charcoal, &c., no difficulty will be met with in the experiment; but white powdery substances, as litharge and oxide of zinc, do not afford satisfactory results. The substances mentioned, in the form of a dry, very fine powder, are rubbed by means of the finger into the tattooed part, which

is then either left to itself or is dressed with dry charpie. As early as the next day, when the swelling of the skin has diminished, we shall find a patch of the colour chosen, corresponding to the punctures made by the needles.

Desirable as it would be to replace the discoloration of *nævus spilus* (*Fleckenmal*), or of *nævus verrucosus* (*Warzenmal*), occurring on the face, by a lighter colour, I have, notwithstanding many attempts, hitherto failed, and I do not know that anyone else has been more fortunate in this respect.*

In combination with the local treatment, many have recommended and carried out an internal treatment, especially in *chloasma uterinum*, but without success. We must not overlook the fact that the patches mentioned, which occur on the face in women, disappear spontaneously after the cessation of the cause leading to their production, that is, the transitory sexual affection. So, also, the pigmentary changes which become developed and remain during the presence of polypi, infarctus, chronic blenorrhœa of the uterus; those which accompany pregnancy, &c., all disappear as soon as these exciting causes have ceased to exist. If we, therefore, administer any remedy internally under such conditions, we are very liable to fall into the error of considering such to be effectual against *chloasma*, though the case was simply one in which a so-called *hysteria cum materia*, for example, subsided during its use. If this "*materia*," the material change of the genital organ, cannot be removed, the *chloasma* remains just as it was before.

I have known females affected with *chloasma* go to the various "mineral springs" and baths (Pyrawath, Spa, Pyrmont, Franzensbad, Marienbad) and the hot sulphur baths at Baden, Teplitz, Trentschin, and Aachen (Aix la Chapelle); and others who were condemned to vapour and *douche* baths: every one returned with the *chloasma*.

I cannot neglect this opportunity of mentioning the abuse of sending patients afflicted with incurable skin diseases, to bathing places or mineral springs, merely because we wish to give "advice," or send the patients away for a time. Such a procedure is of service neither to the physician, nor to the patient, nor to the renown of the place of cure, but discredits, in the highest degree, the first and the last, whilst the patient

* Lately, I have succeeded in removing pigment spots by scooping them out with a spoon, as in *Lupus*. (See *Lupus*, further on.—Tr.)

is punished for a short period of hope, by a long period of disappointment.

I have always considered it advisable, in the case of females affected with incurable chloasma, either to inform them of the incurableness of their condition, or to prescribe for them the employment of a local remedy only, and this consisting simply of some harmless cosmetic. For the latter purpose, perfumers and apothecaries have prepared, from time immemorial, cosmetics whose chief constituent is talcum venetum, or pulvis aluminis plumosi (*Federweiss*), which, when rubbed in, in the form of a paste, with water and alcohol, or of a salve with lard, or quite dry, as a powder, gives to the skin an agreeable white colour, and does not injure it in the least, even if the use of the cosmetic be continued throughout life.

Under the name of Princess'-water, a cosmetic remedy is commonly prepared by mixing together litharge and rosewater; but the remedy mixed in this way is unsuitable. Not perhaps because, as is generally asserted, the lead becomes injurious either to the skin directly, or to the whole system indirectly, by absorption through the former. There is no actual foundation for this statement; more probably, water containing lead is unsuited for a cosmetic, because it easily induces the formation of sulphide of lead on the skin, for which the radical is furnished to the epidermis by the abundant supply of sulphur contained in the horny tissue in many individuals. Or, this disagreeable reaction becomes evident by a black or blackish-grey change, especially visible at the apertures of the sebaceous follicles, when the person affected is exposed to an atmosphere pregnant with sulphuric acid or sulphuretted hydrogen.

In order to avoid this occurrence, and because the name of Princess'-water has already acquired considerable reputation with the public, I have had a Princess'-water prepared (in the manufactory of Treu and Nuglish, of this place), which is free from metal, consisting of alum (*Federweiss*), alcohol, and rose water. I direct this to be applied by painting the white sediment on the skin by means of a brush and allowing it to dry. A quarter of an hour after making the application the superfluous quantity of the white powder, which has dried up, is rubbed off by means of a fine cloth, and the remaining quantity of the pulv. aluminis plumosi is just sufficient to give an agreeable white colour to the skin.

CHAPTER XXX.

(CLASS VI.—DIV. II.—KERATOSES.)

GENERAL REMARKS ON THE KERATOSES.

THICKENING of the epidermic tissue of the skin, in the form of callosities, corns, warts, cutaneous horns, &c., could not well escape the notice of the older physicians. But they devoted much less attention to such morbid appearances, and generally to all external diseases, than to internal maladies and their supposed causes. Thus Celsus, for example, loc. cit., p. 354, treats of the abnormalities in question in the following words: "Clavus autem nonnunquam quidem et alibi, sed in pedibus tamen maxime nascitur, præcipue autem ex contuso, quamvis interdum aliter, doloremque etiamsi non alias, tamen ingredienti movet." And he says, further, in relation to their treatment: "Clavum subindere radere commodissimum est." He devotes greater attention, however, to warts, which he divides into *ἀκροχόρδονα*, *ἀκροθυμία*, *μυρμήκια*, of which the first are pointed below, broad above; the second pointed above and broad below, and whose worst form occurs "*in obscenis*;" whilst the third kind, not precisely described by him, is distinguished from the first two forms, according to his representation, by its occurring on the palm of the hand.

We find the doctrines of Celsus repeated word for word by the later authors, from the time of Galen and the Arabic writers, Avenzoar and Avicenna, throughout the middle ages, and by Fernelius, Gorraeus, Ambrose Paré, &c. Among other terms, they make use of that of *Clavus*, *ἦλος*, *vari callosi* (Galen) for the formations in question.

It is not till the eighteenth century that we again meet with an author (Lorry, in his comprehensive work on 'Dermatology') who deals in an independent manner with the various epidermic

excrecences. Indeed he treats of these in two separate places; p. 515 et seq., loc. cit., under the title 'De cornibus in variis corporis humani partibus nascentibus;' and p. 669, under 'de Clavis, Tullis, Callis pedum et manuum.' In the latter chapter he treats of indurations of the epidermis which correspond to the *τύλοι* of the Greeks and the calli of the Latins, arise from pressure (*compressione*), and are situated, mostly, on the sole of the foot. They consist, according to him, either of an aggregation of epidermic lamellæ, or they have in their interior a hard kernel (*callus*), or in some cases there is a small cavity in the middle containing some drops of clear lymph. They are only situated on the surface of the skin, and if they appear to be more deeply imbedded here and there, yet they are only carried in by pressure from without, by which also they are produced. They have no organic constituents (*i.e.*, no vessels and nerves), and are not sensitive when cut, though they are allied to warts—or, rather, warts sometimes pass into calli. He consequently recommends for their cure that they should be softened and then cut off. In removing them, care must be taken not to cut into the sensitive parts. Sometimes, owing to the pressure of the *clavus* on the structures lying beneath, suppuration is set up in the deeper parts. This unpleasant condition is very intractable, and was described by Salicetus as "*bagantias*."

In contra-distinction to these, he describes, in the chapter first mentioned (loc. cit., p. 515), "*de cornibus*," as of spontaneous origin, proliferations of the epidermis (*Hornhautwucherungen*), cutaneous outgrowths (*Hautauswüchse*), excrescentiæ, which are situated in the skin only, in the epidermis itself, and which he specially distinguishes from the horns and outgrowths which proceed from the bone, and which he calls "*tophi*." He divides these cutaneous abnormalities into two classes: 1st, "*Verrucæ*." These consist of a collection of several warts into a group, the surface of which, by exposure to the air, hardens more and more. Accordingly they are horny on the surface, but connected with the papillæ and nerves beneath. The second kind he names "*Callosa*," and they consist of a mere accumulation of epidermis. (Therefore this kind is identical with the *clavus* previously described; as he indeed says, loc. cit., p. 669, "*Clavus igitur atque callus idem*." The first, however, origi-

nating from pressure, the latter spontaneously.) His third kind, which is connected with the bone, manifestly does not belong here.

In conformity with the views held by Ingrassias, Schenck, Scaliger, Aldrovandus, and the Moravian physician, Zacharias Managetta, and others, he further speaks of larger and smaller outgrowths, consisting of lamellar masses of epithelium, which occur spontaneously on different parts of the skin and on various persons, young girls as well as older individuals; not "tophi," it must be observed, which undoubtedly originate from bone, though they grow *e protensis verrucis*, or consist simply of *lamellæ sibi supercrescentes*.

Plenck places these epidermal formations in his eighth and ninth classes. In the first he describes, under the title "callositates," callus ("die Schwellen"), cicatrix, and clavus. He distinguishes, therefore, much more strictly between clavus and callus than his contemporary Lorry. On the other hand, he mentions in his ninth class, under the title "excrecentiæ cutaneæ," verrucæ, cornua cutanea, hystriçiasis, condylomata, and frambœsia. He quotes remarks on the same subject from Haller, Zacutus Lusitanus, Bartholinus, Leigh, Thoresbi, Ingrassias, Benedictus, and Sylvius.

Bateman* ranges warts (Verrucæ) in his seventh order (Tubercula). He does not, however, consider himself called upon to give an exact description of these growths, because they are usually considered in surgical works. He speaks of other degenerations of the horny tissue only when describing ichthyosis. He says that these outgrowths are improperly called "horns," as they originate merely on the surface of the skin, and have no connexion with the bones, but are made up of lamellæ of a callous substance. In shape they are contorted and irregular, not unlike isinglass. They are formed from two or three morbid conditions of the cuticle, viz., from warts, encysted tumours, and steatomata. In the edition of Bateman's work which appeared in the year 1841, in Leipsic, edited by Blasius, the description of verrucæ, clavus, and callus, in the ninth order, under the title "excrecentiæ cutaneæ," is given

* 'Prakt. Darstellung der Hautkrankheiten nach dem Willan'schen Systeme, bearbeitet von Thomas Bateman, aus dem Englischen von Hanemann. Halle, 1815, p. 96.

somewhat more fully, whilst the cutaneous horns are again discussed in connexion with ichthyosis cornea.

Alibert devotes great attention to corns (*Tylosis*), and divides them into *Tylosis gomphos, indurata et bulbosa*, of which, however, the first only represents a true corn (*Huhnerauge, clavus pedum, cor au pied*); whilst the *Tylosis indurata* corresponds to our callus (*Schwiele*); and the third form, *Tylosis bulbosa*, probably represents an unusual case of the formation of callus (*Schwielenbildung*), under which a bursa may have become developed by pressure. For that is the only explanation of Alibert's remark, "in this peculiar *Tylosis bulbosa* the synovial fluid appears to have a share. It exudes from the capsule of the joint, unites with the tumour, and coagulates in it."

Warts are divided by Alibert into verrucæ vulgares and acrochordon. He also mentions a verruca caduca; and, lastly, speaks of a peculiar kind of warts which he calls fig-warts (*fics*) and describes as outgrowths which occur occasionally on the face, on the front of the neck, &c. They are distinguished from ordinary warts by their surface being smooth, and by their often having a pellicle on their summits, like a fig has. If several such are united in a group, they take the form of a chick-pea, and are then called Verrues de Ciceron (*Cicererbse*). Alibert treats of cutaneous horns under the head of Ichthyosis.

All the later French dermatologists, Biett, Cazenave and Schedel, and Gibert, as also the modern ones, Devergie, Bazin, &c., do not mention the horny growths at all. Rayer is the only one who describes callosities, corns, warts, and horns, and who relates cases of the latter abnormality taken from the writings of previous authors. Hardy only briefly mentions ordinary warts.

The English authors—Plumbe, Thompson, Pearson, E. Wilson, and, more recently, Fox and Hillier—refer the morbid growths of which we are now speaking to the proper place in their respective works. We find that the authors named treat of warts, corns, callosities, and cutaneous horns in a very thorough manner.

The most detailed accounts of these diseases of the epidermis, however, are to be found in German works. Jos. Frank* cites

* Loc. cit., p. 45 et seq.

a comprehensive literature of this subject extending from antiquity to his own times; and though many of his facts will scarcely bear the scrutiny of modern scientific knowledge, still his treatise remains of the highest value for specialists.

More recently, Fuchs has arranged callosities, corns, cutaneous excrescences, and warts, in his group of hypertrophies of the skin, as four different species, along with the hypertrophies of the hairs and nails, and, without seeking a new standpoint, contents himself entirely with that of his predecessors, whose accounts he briefly recapitulates.

G. Simon has investigated the microscopic anatomy of these formations, and has recorded his results in Müller's Archives for 1840, p. 169. Von Bärensprung, who has also devoted attention to the subject, describes,* under the name of Warty Moles (*Warzenmäler*) not only congenital, but also acquired epidermic excrescences. Krämer also deserves mention for his special study of warts.†

Besides these specialists, the pathological anatomists and histologists, Rokitansky,‡ Förster,§ Virchow,|| Wedel,¶ &c., have cleared up many points in connexion with this subject.

Lastly, Lebert,** especially, has described, under the name of *Keratosis circumscripta*, the cases of cutaneous horns hitherto recorded, which he contra-distinguishes from another form of epidermic disease, the *Keratosis diffusa*; and the latter he divides into epidermic, intra-uterine, and extra-uterine.

As the designation of *Keratosis*, chosen by Lebert in the above work for the horny affections of the general integument, appears to me to be very appropriate, I shall treat of callosities, corns, and cutaneous horns, as well as of warts and of ichthyosis, under the same title.

* 'Beiträge zur Pathologie und Anatomie der menschlichen Haut von Felix v. Bärensprung.' Leipzig, 1848, p. 72.

† 'Ueber Kondylome und Warzen.' Göttingen, 1847.

‡ 'Pathologische Anatomie.' Wien, 1856, ii. B., p. 81 et seq.

§ 'Lehrb. der path. Anatomie.' Jena, 1850, p. 502.

|| 'Die krankhaften Geschwülste.' Berlin, 1863, p. 334 et seq.; bes. p. 343 et seq.

¶ 'Grundzüge der path. Histologie.' 1854, p. 451.

** 'Ueber Keratose oder die durch Bildung von Hornsubstanz erzeugten Krankheiten und ihre Behandlung von Dr. Hermann Lebert.' Breslau, 1864.

In the first three forms of disease, the subjacent cutis and its papillæ sympathise but little, or not at all perceptibly, whilst, in the two latter, hypertrophy of the papillæ occurs in a much greater degree, and even appears to be the determining cause of the simultaneous epidermic growth. Consequently these morbid formations may be arranged naturally in two classes: 1st, Keratoses without papillary growth at the same time; 2nd, Keratoses with coincident disease of the papillæ.

CHAPTER XXXI.

KERATOSES WITHOUT DISEASE OF THE PAPILLÆ.

a. *Callositas, Tyloma, Schwielen.*

By this name is designated a thickened portion of skin, of yellowish or brownish colour, horn-like appearance, firm surface, and dense texture, the normal furrows and lines of the skin appearing less distinct. Such a patch of skin is painless, indeed its sensibility is diminished. The callosity varies, according to its situation, in size, character of surface, and shape, the latter being very often determined by the external influences which give rise to the callosity.

In the majority of cases, a callosity is produced by external influences. We have, however, opportunities of observing the formation of callosities developed idiopathically without any known internal cause, and in a situation where pressure from without could not possibly have exercised any influence, as, for instance, on the glans penis.

Every callosity may be regarded as a scutiform plate, consisting of many epidermic layers superimposed on one another, of which the deeper surface rests on the rete mucosum, and, with this intervening, on an essentially normal cutis; accordingly it is only gradually, and by the continual addition of new epidermic tissue which joins the epidermic layers, already present, from below upwards, developed into a plate, which steadily becomes more elevated and sometimes attains the thickness of from one to several lines, and, on section, shows a homogeneous, laminated structure.

The involution proceeds in a manner similar to that by which the callosity becomes developed, and, under certain circumstances, it results spontaneously in a restoration of the skin to its normal condition.

Another way in which its removal may be effected, consists in the collection of a layer of fluid under an ordinarily thick

callosity, probably blastema secreted for the nourishment of the callosity, but, owing to the horny condition of the latter, of no further use. The fluid increases gradually in quantity, presses forward the callous plate, occasionally even becomes purulent, and so forms an abscess the superficial covering of which is formed by the callosity. At length, the fluid escapes from the abscess cavity and the wall of the abscess, the callosity itself, which has been raised, falls off and leaves a more or less normal patch of skin covered with a layer of young epidermis, still surrounded at its circumference by the remains of the former callosity.

Callosities are observed, mostly, on such parts of the skin as are exposed to a frequently recurring, but not continuous, external pressure, and where a bony substratum exists under the affected skin to exercise a counter-pressure. Continuous pressure on the skin does not give rise to a callosity, but, on the contrary, wears the epidermis away or entirely removes it. The form and appearance of the callosity correspond to the bones producing the counter-pressure outwards. The callosities of the palm of the hand are mostly situated over the heads of the metacarpal bones, and, similarly, the callosities of the sides of the fingers are grouped exactly over the bony eminences. On the tips of the fingers, however, the callosities appear smoother and are spread uniformly over the palmar surface of the ungual phalanx.

On many parts of the hand, and of the skin of the rest of the body, callosities are developed by the pressure of tools which are frequently handled. There exists, therefore, a tolerably constant connexion between certain callosities and particular tools. As these are almost everywhere handled in the same manner in the various trades and handicrafts, we can, from the locality of certain callosities, form an opinion as to the tool which has given rise to the callosity; or, in other words, we can, by the callosity, discover the employment of the person affected. Moreover, since the thickness of the callosity has an almost direct relation to the frequency with which the pressure is exercised on it—*i.e.*, to the frequency of the employment of the particular tool—we can at the same time judge, from the extent or other condition of the callosity, whether the person has worked at his trade industriously or not, and whether recently or only long before, the examination. The facts last mentioned are certainly

not of much direct value in reference to pathology, but they are not without importance to the practitioner and the medical jurist. Thus, by way of example, callosities are constantly found in those who work at fires—locksmiths and blacksmiths—on the tips of the fingers, arising from their frequently touching hot bodies. Large callosities are often found among such in the palm of the hand, reaching from the wrist to the part over the heads of the metacarpal bones, owing to the use of files. On the tips of the fingers of the left hand of musicians who play on stringed instruments, we notice small, shield-like callosities from the pressure of the strings; such callosities are found in players on the guitar and in harpists. A pitted callosity is found in industrious tailors on the tip of the left forefinger, which is held against the needle, and a flat callosity in the palm of the right hand from the handling of the smoothing-iron. Shoemakers often possess such thick callosities, on the inner surfaces of both hands, that complete extension of the latter becomes impossible. The furrowed callosities which become developed on the flexor surfaces of their fingers, from the repeated friction of the string (the so-called "wax-end") are also considered characteristic. Lacemakers and other loom workers have rounded callous thickenings of the epidermis as large as a silbergroschen (smaller than a sixpence) upon the extensor surfaces of the second phalanges of the four fingers (not of the thumb) on each hand, resulting from the fingers being frequently struck upon the loom. The use of the plane and saw by joiners is indicated by a callosity which is developed on the fold between the forefinger and thumb of the right hand, and sometimes on the dorsum of the first phalanx of the same forefinger, &c., &c.

NOTE.—I cannot neglect this opportunity of remarking that such a profound disturbance is set up in the whole of the affected surface of the skin by the influences which lead to the production of callosities, that it appears much more exposed to other diseases than those parts not affected by pressure. If, therefore, other diseases, such as Scabies, Eczema, or Variola, attack the skin, we observe that the parts often submitted to pressure become involved much more quickly and in a higher degree than those on which no such irritation has been brought to bear. On the parts where belts, garters, &c., have pressed on the skin for a long time previously, a more copious efflorescence readily becomes developed than on the neighbouring skin, &c. We see at once, from these observations, that it is

unwise to irritate the skin unnecessarily by pressure, friction, or other kind of irritation, because we thereby establish a *pars minoris resistentiae*.

If the callosities produced by various occupations can be regarded as a shield for the skin, by which it is protected, in some measure, from pressure on the part of tools used, this can only hold good so long as the callosity does not become thick, for it will then not only interfere with the movements and flexibility of the fingers and of the hand, but also press as a hard body on the subjacent cutis, and, by inflammation of the latter, cause either the abscess before mentioned ("Bagantias" of Salicetus), or painful and dangerous dermatitis, lymphangitis, glandular swellings, &c., prevent the patient from following his employment, and, in short, as the result of all these circumstances, become an object of medical treatment. The same may be said of callosities on the feet, where they become developed in consequence of the pressure of the shoes, and in proportion to the greater strength of the shoes worn, more so in men than in the female sex. Though they afford, at first, a kind of protection against the pressure of the leather of the sole of the shoe, &c., when more developed they become the source of pain, which impedes standing and walking.

As already mentioned, callosities are found on places which are never exposed to corresponding pressure, such as on the glans penis and on the inner border of the arch of the sole of the foot. These are commonly distinguished from the callosities which arise from pressure by their more uneven, tubercular surface, their darker colour, and their tendency to spread at the periphery.

Such thickenings of the epidermis have been improperly classed with the cutaneous horns, as occurred in the case of idiopathic formation of callosities, which Froriep figures and describes in his 'Atlas of Skin Diseases,' Taf. 363 and 364, and which Behrend and other authors, following Froriep, regarded in the same light. Froriep himself says that the horny excrescence, removed by repeated extirpation, "consisted of a curved epidermic shell about $1\frac{1}{2}$ " in thickness, which, in front, was convex and had an irregular surface, and, behind, presented a smooth, concave surface; so that the whole was rather like a nail, which it also resembled by its greyish brown colour, and by the dry hardness of its surface.

A case resembling this was observed by myself in conjunction with Professor Balassa. The "excrescence" did not give me the impression of a cutaneous horn, but of a callosity, and did not return any more after Professor B. had operated.

b. *Clavus, Leichdorn, Hühnerauge.*

Clavus is a callosity in the form of a cone or of a nail, hence clavus, whose apex is turned towards the cutis, whilst its base looks outwards, and represents the free horny plate of an ordinary callosity. Therefore every corn (*Leichdorn*) is at its free surface properly a callosity. When the apex of this conical callosity is pressed, by a tightly-fitting shoe, for instance, against the cutis, severe pain is often caused. These two conditions, the peculiar form and the frequent painfulness, distinguish the corns (*Leichdorne*) from the callosities (*Tylosis*), which are usually only spread out superficially. Essentially, however, both kinds of callosities are of similar formation, and consequently authors have for the most part made no distinction between tylosis and clavus, but have treated of both forms under one heading. The distinction between these two productions is, however, founded on an anatomical basis, since a callosity is situated merely superficially on the cutis, whilst a corn, underneath the superficial layers of the callosity, appears as a round, white kernel, which is "prolonged in the form of a funnel with concentric lamination towards the cutis, nay, sinks into it" (*Rokitansky*). The relation also which the cutis bears to the callosity is not the same as to the corn. For, callous indurations of the epidermis which have existed for many years, even, do not alter the subjacent cutis in the least, whilst, under the continuous pressure of the clavus, it is gradually thinned, and, at the same time, its papillæ shrink and disappear. Brodie's assertion that a new bursa mucosa becomes developed under the clavus is not borne out in all cases.

We must also oppose the view which has obtained support in various quarters, that the clavus owes its origin to a preceding, small hæmorrhage into the skin, because it is contrary to experience. It is quite possible that a papillary vessel may be ruptured owing to pressure taking place on an already existing corn, and thus an extravasation of blood result, which then

becomes apparent after the removal of the callosity covering it. But such an observation is quite the exception, and therefore the appearance cannot, as a rule, be connected with the production of a corn.

It is well known that corns are usually met with on the toes, and especially on those joints where badly-made shoes occasion repeated pressure and frequent friction. As such pressure usually affects the portion of skin lying over the head of a bone, so also a corn is most frequently developed at the corresponding tangent of such a bony eminence. Thus, clavi often originate not only on the corresponding parts of the outer surfaces of the toes, but also on the contiguous surfaces of any two adjacent toes, as well as on the sole of the foot.

Various influences, especially those which cause a maceration of the epidermis of the foot, produce many alterations in the external appearance of corns. Thus, the corns found on the inner surface of the toes, in contact with a neighbouring toe, are white, and covered with a flat callosity, the surface of which is macerated, whilst the corns situated on the sole and the border of the foot, and on the outer sides of the toes, appear of a yellow or yellowish-brown colour, and have a hard, horny surface.

The number of corns on the same individual, or on the same foot, is subject to great variation. They may occur singly, or a hundred may be present at the same time. On account of its rarity, I may mention a case which was of special interest both to the patient and to the physician. The patient was a tall, stout, vigorous man, whose occupation as a soap-boiler necessitated his standing on his feet nearly all day long. Suddenly the man was seized with very severe pains in his feet. He could only manage to walk in shoes with felt soles by exercising great resolution, and was consequently much hindered in following his employment. As, however, he also experienced severe darting pains in his feet at night, was well nourished and given to the pleasures of the table, the physician whom he consulted declared the malady to be arthritic, gave him appropriate internal remedies and ordered baths, both without result. The patient was then directed to try the waters at Karlsbad. The "mineral waters" gave no relief; after the use of hot-spring baths the condition appeared to improve. The patient still had pain in walking, but was comfortable when the

feet were in a horizontal position. On his return from Karlsbad the old malady reappeared as soon as he attempted to resume his work. After he had again tried the various anti-arthritic remedies, colchicum, spirit. mindereri, &c., and general and local baths, and had passed a second season at Karlsbad—that is, at the end of two years—I was consulted. In accordance with my principle of always closely examining the diseased parts themselves, which had been hitherto omitted by the practitioner, I looked at once, in this case, at the diseased feet, and discovered then the cause of the severe and long continued pains. On the sole of the foot were a large number of callosities, closely aggregated together, of the size of millet-seeds, or of lentils, partly convex, partly concave from mutual flattening, and which had given rise to the severe pains from pressure. Instead of the previous diagnosis of arthritis, I substituted that of clavus, which was also confirmed by the more careful examination of some of the callous formations. It was also shown by the result of the treatment employed, that we had not to do with gout, but only with corns. For, the immediate application of softening remedies, the removal of the individual clavi, and the application of an emollient plaster for some time, sufficed to relieve the long afflicted patient entirely from his pain, and to enable him to resume his employment.

We also exceptionally meet with corns on the fingers and on other parts of the body, caused by carrying loads, by frequent pressure from various bandages, belts, buckles, &c., or by blows from hammers, and so forth.

c. *Cornua cutanea.* *Hauthörner.*

According to Lebert (*vide loc. cit.*), who has devoted particular attention to this disease of the skin, the first cases which distinctly belong to this category were recorded in the thirteenth century. Lanfranc then makes mention of a man who had seven such tumours on his head. The later ones, in the seventeenth and eighteenth centuries, are noted by Bauhinus, Bartholinus, Fabricius Hildanus, Casabonus, Morgagni, Edward Home, Caldani, Macklot, Denonvilliers, Simon, Textor, and others. To quote these, however, in detail, seems superfluous, as anyone can easily consult Lebert's work before mentioned.

Three such cases have come under my notice up to the present time. One of these I saw in the clinic of Prof. Schabus, in Klagenfurt. On the dorsum of the penis there was situated a horn more than 4 inches in length, of the thickness of the little finger, and somewhat bent to one side. The second, as regards duration, I saw in a female patient in my ward. On the head there was a horn an inch and a half in length, of the thickness of a crowquill, and having a pointed extremity. The third case came under care in private. The patient was a man fifty years of age. Rather to the left side of the tip of his nose was a horn an inch in length, of the thickness of a quill, with a broader base, curved in front and below, something like a claw, slightly ribbed longitudinally on its outer surface, and in front having a blunt point. After I had removed it, its base appeared irregularly concave, corresponding to a tubercular, granulation-like, reddish, easily bleeding protuberance, on which the base of the horn rested.

As the name itself indicates, we understand by the term cutaneous horn (*Hauthorn*, *cornu cutaneum*) a truly horny excrescence, of varying length and thickness (1" to 4" long, $\frac{1}{4}$ " to $\frac{3}{4}$ " thick), which becomes developed on various regions of the body, and most commonly in elderly people. Its situation varies extremely. In the 109 cases collected by Lebert from the older and the more recent literature, the seat, in 40, was on the head (and in 25 of these on the hairy scalp, in 11, on the forehead, in 4, on the temples); on the face in 19; on the extremities in 19 (on the upper in 8, on the lower in 11); on the trunk in 7; on the genitals in 8 (on the glans in 6, on the scrotum in 2). There were 12 multiple growths. Lastly, there were 4 cases in which the position of the horns was not given.

The form of the cutaneous horns is also various. Some are cylindrical, some are flattened, and the transverse section of others is oval or elliptical, or resembles that of a prism. Their surface is seldom smooth and shining; mostly, it is wrinkled and furrowed either wholly or partially, lengthwise or transversely, or in both directions at the same time. The cutaneous horns are also either straight, or appear as if twisted on their long axis; often they show many turns, and thus resemble a ram's-horn, or *cornu ammonis*. Rarely, the free end of the

horn is pointed, mostly it is blunt or smooth, sometimes bulbous, often split up and notched, as if weather-worn.

The colour varies from a light yellow to a yellowish-brown or dark brown, with many transitions from greyish-brown to greyish-green, or quite black. They are usually of fine consistence, like the horns of beasts, more markedly so on the outside than internally, where they are crumbling, or often, even soft.

According to Lebert, the microscopic examination of "well prepared longitudinal sections of such cutaneous horns shows that the mass consists of small columns, rods, or palisades lying close to one another, and so intimately united by a connecting medium that they appear blended into a homogeneous mass." The individual columns themselves again possess a striped, fibrous appearance, and consist of epidermic cells strung together. On making a transverse section, roundish spaces are seen, which appear concentrically laminated, and are surrounded by epidermic cells lying irregularly between them. The cells, which are arranged relatively to one another in the manner above described, are always of the epidermic type. They are either simply arranged close to and upon one another, or they are arranged concentrically, in such a manner as to remind one, partly, of the "epidermic globes" of epithelial canceroid, partly of sections of the hyperplastic epidermic cavities in the papillæ of warts, and partly of transverse sections of enlarged excretory ducts of cutaneous glands. Lastly, Lebert, and also Virchow, have seen blood-vessels in sections of cutaneous horns. They did not penetrate deeply into the horn, but were undoubtedly present in the layers nearest to the base.

No chemical analyses of the substance of the cutaneous horns have hitherto been undertaken, and the reason for this is that such pathological formations are so rare that one does not willingly sacrifice them for chemical examination.

All the cutaneous horns hitherto observed have either sprung from the free surface of the epidermis, consequently from the rete mucosum, and were situated on the papillary layer of the cutis, or else the horny growth proceeded from the cutaneous glands, and particularly from a considerably enlarged sebaceous follicle.

The development of the cutaneous horns proceeds usually slowly and painlessly. Only after it has existed a long time, does

the base become painful. It is more painful if the horn is large and frequently dragged on, or disturbed. Naturally, the horn is not itself sensitive, and the cutis corresponding to the base of the horn is, alone, the seat of pain. In consequence of frequent disturbance of the horn, the portion of skin involved may become inflamed, and pass on to suppuration and ulceration. Usually, the part immediately surrounding the horn, that is, the adjacent cutis, is normal; in rare cases, however, it is swollen and hypertrophied. After a longer or shorter duration, the cutaneous horns are shed, and in different cases within very various periods of time. Thus, cases have been observed in which two, three, or four, and exceptionally fifteen to twenty removals and renewals of the horns have occurred within several years, and also the appearance of several smaller horns in the place of a large horn which had fallen off, has been observed. Spontaneous shedding of a horn with subsequent cure occurs with the greatest rarity. If a cutaneous horn is only partially removed, whilst its base is let alone, it usually grows again. A cutaneous horn may be broken off from its base by external injury, a fall, tear, &c. This does not, however, prevent its reproduction.

Etiology.—It would be quite superfluous to treat of the causes which give rise to cutaneous horns, inasmuch as no one has, as yet, any clear idea on the subject. It is true that in some works we find external mechanical influences given as causes of cutaneous horns, such as pressure, contusion (Frank, loc. cit., 3 B., p. 55; Fuchs, loc. cit., p. 44; Rayer, 3 B., loc. cit., p. 250), wound of the skin from a razor (*Vicqu d'Azir*), or from an arrow (*Zacutus Lusitanus*). But these reasons have no more justification, and afford no better explanation of the origin of cornua cutanea, than Hartmann's phrase, which has been so readily adopted for these and similar cases, "*est lusus naturæ*," or the "*nisus excrescendi*" of other authors. If we give due weight to the circumstance that the cutaneous horns hitherto described were situated on the hairy scalp or on the genitals, and, also, to other conditions which may be discovered in the cases observed and recorded in literature, there is not the least foundation for accepting the opinion that the cutaneous horns arise from external mechanical influences such as those mentioned. We prefer to state plainly, that the cause of the production of cutaneous horns is wholly unknown to us.

Treatment.—It is evident that the successful treatment of the horny excrescences of the skin consists, solely, in the employment of means by which not only the morbid formation itself, but also the matrix from which it is produced, will be entirely removed. Now and then, the simple tearing out of the horn is successful; it readily, however, grows again. We prevent this by an immediate and energetic cauterisation of the surface from which it grew, by means of caustic potash or chloride of zinc. It is preferable, however, to adopt the ordinary surgical practice which we commonly employ in the extirpation of encysted tumours or steatomata (*Lipomen*), and to remove, at the same time, the piece of cutis from which the horn arises. When thus treated, experience has shown that the disease does not recur.

CHAPTER XXXII.

WARTS.

Keratosis with Disease of the Papillæ (a).

WE include under the name of Warts, hard, horn-like, semi-globular formations, which are mostly fissured on the surface, are of the size of a lentil or bean, occur usually on the hands, but also on any other part of the surface of the skin, and are generally painless and of long duration. We generally distinguish those which are noticed at the birth of the child (*Nævus verrucosus*) from those which originate in after life (*V. acquisita*). The former are far less frequent than the latter, and are further distinguished from the acquired both in reference to their anatomy and their course.

a. Verruca congenita.—The congenital warts occur, usually singly, on one or only on a few places. Their surface is more or less smooth, and covered with normal, though it may be highly pigmented epidermis. At a later period of life, they are generally covered by a considerable quantity of thick, beard-like hairs. They generally vary in size from that of a silbergroschen (rather less than a sixpenny-piece) to the palm of the hand, and, though small in the new-born child, they grow by degrees to the size above mentioned, and become at the same time darker and firmer.

They generally occur in this form on the face or on the trunk, distributed here and there. In some cases, I have seen such warty excrescences arranged on the plan of an eruption of zoster; not only corresponding to pectoral zoster, but, also, to that of the extremities, that is, along the course of a peripheral nerve. I possess a drawing, sent to me from Milan, of a case which came under observation in the Hospital there, in which the nævus stretched, after the fashion of bathing-

drawers, from the loins over the pelvis down to just above the knees, and had a well defined margin. Another case of a nævus of unusual extent came under my notice in an imbecile patient affected with muscular contraction, in whom warty formations, of the size of the palm of the hand, deeply pigmented and hairy, were to be seen on many parts of the trunk, face, and extremities. The presence of these nævi, in such large numbers, gave the individual affected so remarkable an appearance, that he even afforded material to the credulous public and to rumour, for the story that the spotted man was born as a consequence of coitus between a human female and a male, Danish mastiff. Finally, I possess a drawing of a nævus verrucosus (Præp. 120) which extended forwards and downwards, from near the last thoracic vertebra, towards the anterior inferior spine and over the whole of the buttocks, in the form of a miner's breech-leather.

Although we admit that truly congenital, warty formations have been observed on the skin, as described, yet we must point out that they are of infrequent occurrence, contrary to the commonly received opinion that the highly pigmented, wart-like production occurring on the trunk, on the face, or on the extremities, represents a nævus, *i.e.*, a congenital formation. If we compare the extremely small number of the pigmentary changes and warts observed at birth, with the extraordinary frequency with which the same are met with on the skin of those who are grown up, we must come to the conclusion that the greater part of the so-called nævi originate in the course of extra-uterine life, and that only very few are really congenital.

β. *Verruca acquisita* are those warts which make their appearance after birth. They must be separated into the *perennial*, which, having once originated, last throughout the whole life (*V. perstans*), and the *transitory*, which, though often remaining for a comparatively very long time, finally disappear spontaneously (*V. caduca*, Alibert). They appear most commonly in the form of semi-globular formations of the size of peas, either of the same colour as that of the rest of the epidermis, or of a greyish green, dark green, or even of a black colour. Their surface is either smooth, or furnished with numerous small protuberances. Mostly, in their centre is seen a group of eminences closely pressed together, which are enclosed by an epidermic border. There are, however, also

warts of a conical shape, and some which are mounted on thin stalks, and assume different shapes according to their size.

Finally, there are yet to be mentioned those warts which are most frequently observed in elderly people, on the face and nape of the neck (but also in other situations), which are larger in circumference than the former, but are not so markedly raised above the level of the skin, have a dark grey or blackish colour, and now and then form the starting-point of an epithelioma. This species of warts may be named *Porrum*, according to Plenck, from the similarity to the umbellate flowers of the *Allium porrum*; or *Verruca plana*, according to Ascherson (Casper's 'Vierteljahrsschrift,' 1835, p. 513).

We must mention that warty growths may have either a sub-acute or a chronic course. There are cases in which a great number of warts develop in various parts of the body at the same time, but chiefly on the face, so that they might be mistaken for the efflorescence of some other skin disease. They remain for several months and then disappear spontaneously. I have often seen such cases. Once, a number of warts appeared so quickly on the face of an individual (a smith), that in the course of a week, only, they developed to such an extent that he was prevented by them from shaving his beard. He was in the habit of shaving himself weekly. Though he had noticed nothing unusual on his face while shaving the previous week, so many warts of large size were present the following week that the razor could not be used without cutting into them. Several months later, all these growths had shrivelled up and fallen off spontaneously, and the patient shaved himself as well as before. On other parts of the body also, such a comparatively rapid development and subsidence of warts is wont to occur, as, for example, on the hands. Here, however, they mostly remain for years.

The sudden eruption of a great number of warts has led the humoral pathologists to suppose that there is a peculiar dyscrasia verrucosa which lies at the root of this phenomenon.

Careful observation of warts at different stages shows that these formations are situated beneath the epidermis at their commencement, and that as they develop further, they push forward the epidermic lamina lying over them, and thus their surface still appears smooth. When, in consequence of con-

tinued growth, the enlarged papillæ, having thrown off their epidermic covering, become apparent, the warts are then seen to be merely surrounded by an epidermic rim, within which the proper substance of the warts is represented by the separate, thread-like elevations. After a longer duration, when they have changed their originally light colour to dark grey or black, the body of the wart, now become shrivelled, falls out from the epidermic rim surrounding it, in the form of a semi-globular or even globular mass. The skin and its epidermis become fully restored again at the part from which the warts have fallen out, without the formation of any scar.

These warts are generally called *Verrucæ vulgares* (Simon); *V. simplices*, *V. solitaires* (Krämer), and their subdivisions may be enumerated as *V. filiformes*, *s. acuminatæ* (v. Bärensprung), *tuberiformes*, *sphæricæ*, *cylindricæ*, *pediculatæ*, *dissolutæ* (Krämer). From them must be distinguished those excrescences of the integument which have more or less similarity to true warts, but are chiefly distinguished from the latter by being more or less covered with a quite normal epidermis, and either continue throughout life, or occur merely as transitory formations. The first are the so-called soft warts (*Verrues charnues* of the French), and generally represent an elevated duplicature of the skin, a sort of hernia of the skin, without any, or with only slight, fatty contents. They are also called *Nævus mollusciformis*, or *N. lipomatodes*, according to Walter. Simon, v. Bärensprung, and Krämer have fully described these warts in their respective treatises.

The second form of tumours frequently considered to be warts, are those which occasionally exhibit milky-fluid or stearine-like, or, in a word, sebaceous contents, and which, if they increase in size and are mounted on stalks, represent the *Molluscum contagiosum* of Willan. If we meet with them while they are small, semi-globular, or globular structures of the size of a millet-seed or of a pea, they have a deceptive resemblance to warts, as the hard, dark brown sebum contained in them appears in the form of small, filiform protuberances, surrounded by an epidermic border. They are distinguished, however, invariably, from the proper warts by their slight hardness, as well as by the circumstance that their contents can be squeezed out by lateral pressure in the form of a globular, white, and

occasionally soft, cheese-like, sebaceous mass. A disproportionately severe hæmorrhage generally follows from the cavity which remains. This form also corresponds to those structures which Ribbentrop has excellently described (in 'Magazin f. ges. Heilkunde,' 64 B., 1 Heft) under the name of Grützbeutel or Comedonenscheiben.* Also, to the subcutaneous condylomata described by Hauck ('Med. Ztg. v. d. Verein für Heilk.,' 1840, p. 245) and the porcellaneous condylomata of Fritze; both of which kinds are considered by many authors to be due to syphilis. Krämer and Simon also mention these forms, and the latter figures them in 9 Taf. fig. 6, in section. The form represented by Krämer, loc. cit., Taf. II. fig. 6, and named *Molluscum simplex*, is of exactly the same nature, but the excretory duct of the follicle is closed.

We shall include in our consideration of the subject of warts an account of the pointed warts (*Spitzen warzen*, *Spitzen condylome*, *Cond. acuminata*, *Végétations dermiques*), inasmuch as they also occur on the skin.

They are fine, pointed, filiform elevations, which either exist separately, or form a group, or, being subjected to mutual pressure, take on manifold shapes, and thus resemble tufts, cocks' combs, &c. Sometimes they appear of the colour of the normal skin, sometimes of a pale or blood-red tint, according to their richness in blood-vessels, or in proportion as their epidermic covering is more or less macerated or is preserved in thick laminae. If they occur in places where maceration of their epidermis can take place, as around the anus, on the inner fold of the prepuce, on the inner surfaces of the nymphæ, &c., they appear of a light or deep red colour. Where they are placed on a free surface and are kept dry, they have the colour of the normal epidermis.

The manner in which they are mutually arranged has given authors the opportunity of comparing them with all sorts of fruits; mulberries, raspberries, cherries, bunches of grapes; with cauliflower or with other objects, such as cocks' combs, &c., and of designating them accordingly, as moriformis, frambosoides, cerasiformis, uviformis, cauliformis, merisée (*Vogelbeerenähnlich*), crista galli, &c.

These variously shaped structures become much modified in

* See vol. i., pp. 122 and 131.—Tr.

external appearance in the course of their existence, since they sometimes become greatly multiplied and enlarged, or, on the contrary, sometimes atrophic. At the base, however, or rather from the base, they steadily increase, so that their complete spontaneous involution cannot be expected. At least I know of no case in which the pointed warts have spontaneously atrophied and disappeared, as occurs in the case of ordinary warts. On the contrary, I recollect cases in which the pointed warts had persisted for many years. The penis appears to be a favourite seat for these pointed warts. They spread out on it in all directions after existing for months or years in extraordinary numbers and with disfiguration of the member, and may then easily be mistaken for epithelioma. They also occur in large masses on the labia, and even on the commencement of the vaginal and rectal mucous membranes.

The *anatomy* of all kinds of warts has been so comprehensively illustrated by Krämer,* V. Bärensprung,† G. Simon,‡ Wedl,§ and Virchow,|| that we cannot do better in relation to this subject than recapitulate here the results arrived at by the authors named. Whatever may be the form and size of a wart, or of a pointed condyloma, it always consists of a connective-tissue framework, which determines the form of the excrescence, in whose interior a vascular loop is found, and whose exterior is covered with a more or less thick epidermic layer. The earlier observers were of opinion that such an outgrowth of warty and condylomatous formations could only occur from an existing papillary layer, that is, from the papillæ themselves. But the circumstance that similar formations appear on such parts of the skin where no papillæ exist, and also on mucous membranes as well as on other tissues, shows that a pre-existing papilla is not necessary to their production. A connective-tissue basis, even, is sufficient, from which papillary or warty excrescences can originate at any time (*Fibroma papillare*, Virchow).

We must regard every warty and condylomatous new growth

* 'Condylome und Warzen.' Göttingen, 1847.

† 'Beiträge zur Anatomie und Pathologie der menschlichen Haut,' Leipzig, 1848.

‡ Loc. cit., pp. 37 and 231.

§ 'Grundzüge der pathologischen Histologie.' Wien, 1854.

|| 'Die krankhaften Geschwülste,' p. 335.

as arising from outgrowth of the connective tissue; whether it be that the connective tissue of a normal papilla grows towards the free surface of the skin; or the connective tissue of the wall of a follicle grows into the intra-follicular space (condylomata endocystica, intra-follicularia), and, from thence, towards the free surface, after the manner of a papilla; so that the framework consists of old and young connective tissue.

In the interior of these warty and condylomatous formations there are small and large vascular loops in varying quantity, and the blood contained in them is the cause of the corresponding colour of the warts, as well as of the bleeding which so easily occurs from these excrescences.

On this connective-tissue basis, which is provided, internally, with vessels, lies, externally, a more or less thick epidermic layer which hides, in a greater or lesser degree, the red colour of the blood, and gives to the warts their sense of resistance to the touch, and, partly, their appearance.

Virchow very appropriately compares the development of the condylomata and warts with the formation of the so-called granulations or fleshy warts occurring during the restoration of lost skin. This idea receives confirmation from the fact that we can often observe the same occurrence in old ulcers. Also on parts of the skin where ulceration has been going on for some time, after the successful skinning over of the latter, a great number of reddish, warty protuberances may be noticed, partly of the same colour as the normal skin and partly pigmented..

Moreover, the form, shape, consistence, and colour of the condylomatous and warty formations depend on the relative proportion which the connective-tissue framework and the vessels contained in it bear to the external epidermic covering; as well as on external influences, such as the action of moisture and heat (maceration), mutual apposition, &c. Thus, in regard to the first condition, according to Virchow, the pointed warts possess only an extremely thin connective-tissue framework, which grows from the adventitia of the vascular loops, but, on the contrary, a very considerable external epidermic covering, whose deepest layer consists of the rete Malpighii, on which lie the epidermic cells distinguished by their transverse arrangement. Under such conditions, the rete Malpighii stratum appears to rest directly on the vessels themselves. In the second place, in

connexion with the action of external influences, warts appear of the same colour as the rest of the skin, white, red, rosy, glistening, transparent-white, moist, dry, hard, filiform, isolated, or grouped in the form of cauliflower-heads, raspberries, &c.

Wedl also (loc. cit., p. 451) agrees essentially with this view when he says :—"The papillæ are therefore, according to what has been said, to be regarded as the rounded ends of the connective tissue new growth, and form, by their coherence, the basis of the papilloma."

Etiology.—The older physicians believed, as at the present time the great mass of the public still believe, in a number of causes which produce warts. Thus, for instance, frequent association with the lower animals—cows, fowls, &c.—and contact with them, repeated moistening and dirtying of the hands, the handling of the genitals, particularly of the female (Hufel. Journ., B. 9; 3 Stück, p. 183), were and are regarded as causes of the production of warts.

Moreover, certain diseases may be followed by warts. Thus, Marc relates a case in which a great number of horn-like warts developed on the face and on the fingers, in consequence of an apoplectic attack (Rayer, loc. cit., 3 B., p. 244); and Jos. Frank (loc. cit., 3 B., p. 58) states that suppression of the "menses" may be regarded as a cause of the formation of warts. Nearly all authors, however, speak of a peculiar "disposition" (Neigung), in certain individuals, to the production of warts, and a peculiar dyscrasia v. acrimonia verrucosa. The latter of these is, however, considered doubtful by others. The assertion that blood drawn from warts possesses the power to produce fresh warts on parts of the skin which come in contact with it is only regarded by a few as correct, notwithstanding that surgeons even, as Barruel, support the same. The latter relates that a whole chain of warts formed on the back of his hand, after blood had flowed over that part during an excision of warts. Wilson rightly says respecting this view (loc. cit., p. 578), "such a supposition is too absurd to deserve any further attention."

Also the so-called "fright" (Versehen)* of pregnant women has been, and is, frequently connected, as a cause, with the

* See p. 71,

congenital warty formations, *nævi*. Many anecdotes to this effect have been related by the older, and also by modern, authors. (Thus, particularly, by Daniel Turner, in 'Abhandlung von den Hautkrankheiten,' Altenburg, 1766.) Without going further into this theory of "fright" (*Versehenstheorie*), we beg leave to call attention to the rarity of the occurrence of such warty productions in newly-born children, whilst scarcely any pregnant woman is protected from mental impressions of the most varied character and number; consequently the opportunities for "fright" (*Versehen*) are innumerable. We prefer to confess that we are not aware of any cause for the production of warts, either acquired or congenital, and that we nevertheless cannot support so vague and undemonstrable a theory as that of the "fright" (*Versehen*). The statistics of warts cited in dermatological works do not fully correspond to the actual conditions. Thus, it is asserted that these formations are more frequently met with in children, juvenile individuals in general, and in the female sex, than in males, and at an advanced period of life. Further, that they become developed oftener in individuals who work hard with their hands, never wear gloves, and do not wash often enough, than cleaner persons belonging to the higher ranks.

I have had the opportunity, during a long series of years, to examine hundreds of thousands of persons stript naked, and, thereby, to inspect the skin of the general surface, as well as of the hands and feet, to assist in the diagnosis of an existing skin disease. In this collection of people, all classes, occupations, handicrafts, ages, sexes, and races were represented, though, undoubtedly, the greater number of them belonged to the working classes. I cannot, however, remember to have encountered warts in distinct preponderance in either sex, or any handicraft or age. I must, therefore, on this subject, agree with those authors who commence their statement of opinion of the etiology of warts in general, with the words "the influences causing warts are still very obscure" (*Fuchs*).

On the contrary, the formations known by the name of fig or moist warts are limited as regards localisation as well as regards the influences which constantly lead to their production. We find these excrescences almost exclusively, for instance, on and around the genitals, around the anus, on the buttocks, in the

armpits, under the mammæ (on the skin of the thorax covered by them), and only in those cases, in which the parts of skin named become macerated and irritated by collections of diseased secretions, especially in connexion with blenorrhœa.

They are, as is known, a manifestation of venereal contagious products, not, however, of products produced by syphilitic contagion. They do not stand, however, in the same relation to the blenorrhœa which causes them, as the so-called broad condylomata (plâques muqueuses) do, to the syphilitic contagion which produces them. For, whilst the latter, a product of syphilis, are able to generate syphilis again, either on the same individual (auto-inoculable) or on other individuals to whom they become transferred, the so-called pointed condylomata are never contagious, neither in the sense of self-propagation nor of the production of a blenorrhœa. The experiments by which Dr. Kranz* lately believed he had proved the transferability of the pointed warts do not appear to me sufficiently exact to set aside the results of previous experience.

Treatment.—In regard to the treatment, as also in reference to the etiology, both of the common and of the moist warts, superstition has exercised great influence, and a multitude of nonsensical remedies have been highly lauded by the laity and even by physicians, for their efficacy in curing these maladies. They do not merit any further notice in this place. It is evident that we can only attain a permanent cure either by means of the knife, ligature, or cautery.

It is always preferable to remove the warty formations by means of the knife or of the scissors, and we should only resort to the ligature or the cautery in case the patient rejected this kind of procedure, or if the warts are awkwardly situated for such treatment.

Before, however, we adopt either of the procedures mentioned, we endeavour to ascertain whether the warty formations cannot be turned out and set free from their situation, by pressure with the finger-nail. By attacking them in this way, we can, not unfrequently, remove not only the dry warts on the face, but also the moist warts on the genitals. Next, if this does not

* 'Beitrag zur Kenntniss des Schleimhautpapilloms,' Arch. f. klin. Med., ii. B., p. 80 et sequ.

succeed, we use the scissors, of which the best are the curved ones of Cooper, seize the growth at the base as deeply as possible, and remove it with a quick, powerful snip of the instrument. Or, we use a scalpel or bistoury for this purpose, removing the new growth by means of two oval incisions surrounding the base of the wart.

Either after the preceding treatment, or even without it, we can remove the warts by means of caustics, but this is a more tedious and painful plan. For this purpose we use potassa fusa, nitrate of silver, concentrated mineral or vegetable acids, acetic, hydrochloric, sulphuric, nitric, or chromic acids, chloride of zinc, butter of antimony, &c. The more powerful caustics—for instance, sulphuric acid, potassa fusa, and nitrate of silver—if properly applied, will succeed generally on one application, whilst the less active acids, hydrochloric, nitric, and acetic, require repeated applications. We apply these caustics by means of a glass rod, taking up a drop of the fluid, and we protect the surrounding skin by means of a circle of wax.*

Since, by means of these caustics, we not only char the excrescence, but, with a view to a permanent result, must also destroy the vessel leading to it, a slight reaction is sometimes set up in the neighbouring parts, by the intense action of the remedy. This, however, mostly, quickly subsides, and but seldom involves the deeper structures or leads to a true dermatitis. Nevertheless, cases have been known in which, after the extirpation of warts by means of the knife or of caustics, erysipelas, gangrene, and even death have resulted.

The method of removing warts by means of the ligature is painful and frequently unsuitable. At most, it is only applicable in stalked warts and in persons who are very much afraid of the knife. Among the common people, yet more tor-

* The protecting circle of wax is prepared in the following way:—We soften a piece of wax of appropriate size in warm water, knead it between the fingers into a ball, and press this flat upon the wart. We then scratch away with a knife the portion of wax situated immediately over the wart, and leave, therefore, the rest of the wax surrounding the wart in the form of a circle, firmly adhering to the normal skin. This circle, if it projects somewhat beyond the level of the wart, affords a convenient receptacle for the drops of the caustic fluid.

turing methods of removing warts are still employed. Such, for instance, as transfixing the wart by means of a needle and then making the needle red-hot by means of the flame of a candle. If we wish to make use of the red-hot wire, the galvanic cautery answers for this purpose exceedingly well.

The latter treatment is to be preferred in cases where pointed warts are accumulated in great masses; because, by this means, we more certainly avoid the rather severe bleeding which is otherwise liable to occur. In all other cases, the various caustic fluids and powders, some of which have just been mentioned, or cutting instruments, or the ligature, will be found suitable for the removal of the pointed condylomata.

CHAPTER XXXIII.

ICHTHYOSIS. FISCHSCHUPPENKRANKHEIT.

Keratosis with disease of the Papillæ—continued (b).

It was impossible that so remarkable an alteration in the general integument as that caused by the fish-skin disease should escape the notice of our forefathers. We, however, find this disease described for the first time by Avicenna, under the denomination of *Albarras nigra*. In describing its characteristics, he uses the following words: "*Est scabiositas accidens cuti aspera vehemens, et facit squamas sicuti sunt piscium.*" The physicians of the middle ages seem to have classed ichthyosis with the lichen, lepra, and scabies; or they gave it all sorts of strange names, comparing it with the skin of certain animals, as of the lion, porcupine, hedgehog, &c. Hence arose the names *Leontiasis*, *Hystricismus*, &c. Again, in the seventeenth century, we find histories of cases of such extraordinary natural appearances cited in the writings of Bartholinus, Panarolus, and Stalpart van der Wiel. Boissier de Sauvages speaks of a *lepra-ichthyosis*, which he considers to be synonymous with the *Impetigo excorticativa* of his own time, and the *Albarras nigra* of Avicenna, and which he characterises in the following words: "*Est ea in quæ diversæ corporis partes teguntur squamis siccis, albidis, successive superincumbentibus, eodem modo atque ordine quo squamæ piscium.*" He mentions, further, a patient in whom the scales not only had the same appearance as in the fish, but also emitted a fish-like odour.

The case of Edward Lambert, born in the year 1710, in Ireland, which was first described by Joh: Machin, appears undoubtedly to have contributed, first, to the more accurate knowledge of ichthyosis. He was, as is known, the parent of a whole family affected with ichthyosis. Heinrich Baker

described Edward Lambert, when grown up, in the year 1755, and when he was already the father of two sons, who made a tour through England, Germany, and France, and exhibited themselves for money. The most exact account of this rare family we owe to the Leipzig physician, Tilesius, who found fault with the name of *Stachelschweinmensch* (porcupine-man) hitherto in use, and proposed, instead, the designation *Krustenmann** (crustaceous-man). His sketch of this skin disease agrees in many points with the most recent observations.

Lorry also took notice of this porcupine or crustaceous family, but nowhere, however, uses the expression *ichthyosis*, though a skin disease caused by thickening of the general integument appears to have been not unknown to him.

The nosological and dermatological works which appeared at the end of the last and in the present centuries contain a short definition of the disease which we are considering. It is, however, in Willan's treatise, only, that we meet with a comprehensive description of *ichthyosis*.

This dermatologist not only knew the deformity which has received the name of *ichthyosis*, but he was also familiar with the lower degrees of disease which are indicated by slight thickening of the epidermis, and irregular desquamation of it. The views expressed by him were adopted by his contemporaries and successors in France as well as in England—Plumbe, Thomson, Alibert, Bielt, &c.—without, however, their contributing much to a further acquaintance with this skin disease.

With all due deference to Willan, however, we must be allowed to suggest, in the case of *Ichthyosis faciei* figured by him in his work in Taf. 8, the correction that, according to our views, this case must not be regarded as one of *ichthyosis* but of *seborrhœa faciei*. This view also agrees with that of other authors, since they choose the name *ichthyosis sebacea* for the disease.

Recent microscopic examinations of the crusts in *ichthyosis* have led to real progress. It has been especially pointed out

* 'Ausführliche Beschreibung und Abbildung der beiden sogenannten *Stachelschweinmensch* . . . oder the porcupine-man.' Altenburg, 1802.

that the morbid accumulation of epidermic masses is caused by fatty degeneration of the epidermic cells, and the names of Schlossberger* and Albert Schabel† must be mentioned in connexion with this subject.

Also, we find that Fuchs‡ and Behrend§ mention an ichthyosis congenita, without, however, describing it further, and it is therefore uncertain whether the latter considers the malady in question to be of the same nature as the *Scutulatio s. Incrustatio* described by Steinhausen.||

By the name Ichthyosis or Fischschuppenausschlag, is understood that morbid alteration of the cutis which is shown by the formation either of white epidermic masses of the thinness of paper, or of dark-coloured, greyish green, brown, or black masses, which are firmly fixed to the subjacent cutis, and which, in the normal condition, cause the furrows and lines crossing the epidermis to be rendered evident in a very definite and striking manner.

If we wish to have a clear perception of the various characteristic morbid appearances of ichthyosis, this will best be attained if we undertake a closer examination and study of the course and development of this disease, either in a case just commencing, for which the opportunity but rarely occurs, or in a case of relapsing ichthyosis, for which we more easily find opportunity. In the latter case, we first notice a slight scaliness of the epidermis, and the individual scales, at least as large as hemp-seeds, being firmly fixed at their centre, but at their periphery, on the contrary, adhering loosely, exhibit a white lustre, and impart to the surface of the skin an appearance as if it had been sprinkled over with meal or a white powder. We can produce artificially an appearance resembling this stage of ichthyosis by slightly scratching the skin of any dark, healthy individual. This form, answering to the first stage of

* 'Erster Versuch einer allg. und. vergleichenden Thier-Chemie.' Leipzig, 1856, 1 B.

† 'Ichthyosis congenita, Inaugural-Abhandlung.' Stuttgart, 1856.

‡ Loc. cit., p. 696.

§ 'Ikonographische Darstellung der nicht syphil. Hautkr.' Leipzig, 1839, p. 83.

|| 'De singulari epidermidis deformitate.' Berolin, 4°.

ichthyosis, would merit equally well the name, *Pityriasis vulgaris*, or *simplex*; or, especially if there were a more marked development of the separate scales, give to the skin a parchment-like aspect, and thus justify Alibert's designation *Ichthyosis nacrée*, or *Ichthyosis nitida*, mother-of-pearl ichthyosis.

In other cases, on the contrary, the epidermis is accumulated, at the outset, in much more considerable quantity, and its structure and colour are at the same time altered, and a deep discoloration becomes developed, usually of a greyish green tint, so that it decidedly in some measure resembles that of a snake, whence the name *Ichthyosis serpentina s. ciprina*. We would designate this form, in which ichthyosis most frequently comes under our notice, as *Ichthyosis simplex* or *vulgaris*.

Ichthyosis reaches a still higher grade in those cases in which the epidermis increases to compact horny shields and spines several lines in height, and thus goes through all those metamorphoses which horny tissue is wont to show when nourished longer than usual. It becomes of a dark brown or black colour, more compact—always, however, brittle—and by no means so hard as true horn (for example, nails, claws, and hoofs), for it can always be indented by pressure with the finger-nail. The comparison of such a skin to that of a rhinoceros, porcupine, &c., is an exaggerated one, and the names *I. cornea s. hystrix*, *s. hystricismus*, made use of for this form of ichthyosis, are only to be understood figuratively and of the same signification as the expression which Tilesius applied to the malady in the monograph on the Lambert family before mentioned (Altenburg, 1802), when he wished to substitute, instead of the name “porcupine-disease,” that of the “hereditary, fissured, crustaceous skin” (erblichen geborstenen Hautkruste), and instead of “porcupine-man” that of (“Krustenmann”) “crustaceous-man” (Homme porcépic, Hystriatio, Spinositas; Fuchs, *Ichthyosis cornea acuminata*).

Authors are divided in opinion as to whether ichthyosis should be regarded as a congenital or as an acquired disease. First of all, we must point out that there is a rare affection which has been described as *Ichthyosis congenita*, in which the skin of the newly-born child is of a brownish-red colour, sward-like, fissured, and, owing to the fissures, its surface appears mapped out into large plates, and is in a condition like that of

the skin of a roasted apple, or of a roasted sucking-pig (cochon de lait), or resembles the appearance produced by scalding the skin with a moderately hot fluid. Whilst certain authors, as G. Simon and Steinhausen, regard this condition as ichthyosis, others look on it as different from this, as *cutis testacea* (Berend). I should agree with the latter, because in most of the cases in question observed by myself and other authors, ichthyosis could not become developed at a later period of life, since the children affected lived only for a few days; therefore no one could assert positively that from this morbid condition of the skin, arising in intra-uterine life, the usual form of ichthyosis would be developed later. Moreover, I have met with a case in which a child affected with this deformity was not only kept alive by careful nursing and appropriate treatment, but is still at the present time, after several years, perfectly well, and exhibits a thoroughly healthy skin.

According to my experience, children in whom, at a later period of life, ichthyosis becomes developed, show no abnormality of their skin whatever, at birth, and we cannot discover anything either on the surface of the epidermis, or in the condition of the eminences corresponding to the papillæ, which would indicate a future ichthyosis. It is only at a more advanced period, at about the age of 2 years, that the first symptoms of ichthyosis usually become visible, and they appear in that succession of intensity which we have before mentioned, first as *Pityriasis*, then as *Ichthyosis simplex nacrée, nitida*, and, finally, as *Ichthyosis cornea, s. hystrix*.

I do not believe, therefore, in the existence of an ichthyosis congenita, in the ordinary sense of the term *morbus congenitus*, i.e., a disease present at birth. If, however, we merely mean by the term "*morbus congenitus*," that the conditions necessary to the later development of the disease are present as an original, morbid disposition of the skin, then nearly every case of ichthyosis will be named congenital; that is, the substratum of the skin from which the epidermis is formed (and the papillary layer especially), is already, in its original nature, so disposed that an abnormal instead of a normal epidermis is formed later in life.

In reference to the appearance of ichthyosis at different periods of life, it may be mentioned that till the second year,

there is either no trace of any disease whatever to be seen on the skin or merely a pityriasis. From this condition, the ichthyosis usually develops to the stage in which it continues to remain throughout life, with but little variation in intensity.

The malady is mostly diffused over the skin in such a manner that with the exception of the bends of the joints, of the genitals, of the palms of the hands, and of the soles of the feet, and, lastly, of the face, it affects the whole of the skin. It especially attacks the skin of the elbows and of the knees and the extensor surfaces of the extremities.

Exceptions to the above mode of diffusion are, however, sufficiently common. Thus, in certain cases, ichthyosis becomes developed on the palm of the hand and the sole of the foot, in the form of severe *Ichthyosis hystrix*, when the epidermis in those situations is not only thickened in the form of a callosity, but also furrowed with numerous transverse and longitudinal cracks, and its surface assumes a warty or spinous appearance. The face rarely exhibits a high degree of ichthyosis, but a slight pityriasis is mostly noticed on the face, as well as on the hairy scalp, in those individuals who, at the same time, show a slighter or higher degree of ichthyosis on the rest of the body. Usually, the skin on the places mentioned appears affected *in continuo*, and, mostly, over patches at least as large as the palm of the hand, the surface of the skin is grey, greyish green, brown or black, rough, and fissured. In a few isolated cases, however (as in the one published in my Atlas, Taf. i., Heft. iii.), the ichthyosis, and especially its higher grade, *I. cornea*, s. *hystrix*, occurs in the form of warty eminences arranged in rows, between which can be seen smaller or larger, normal portions of skin. These elevations of the skin, arranged in the form of lines, have, as a rule, the same direction as the peripheral spinal nerves which run beneath them. As we had the opportunity of observing similar lines in the eruptions of herpes zoster, as well as of variola, psoriasis, and other cutaneous lesions, we need not be surprised to find such an arrangement exceptionally in ichthyosis.

In whatever form the ichthyosis occurs, it attains a certain degree of development in each particular case, and then usually remains unaltered throughout the rest of the patient's life. Very exceptionally, we have had the opportunity of observing

that general diseases of a severe character and of long duration, principally the acute exanthemata, have effected either a temporary or permanent cure of this disease. Two such cases have come under my notice. In one, an attack of measles, in a girl about eighteen years of age, caused a previously existing *I. simplex* wholly to disappear. In the second case, a high degree of *I. cornea*, diffused over the skin on the usual positions, and which especially affected the hypogastric region in the form of black, horny spines, was permanently cured by a severe attack of variola. In the latter case, we only noticed pocks on those parts of the skin which were free from the ichthyosis, such as the face, the neck, the armpit, the bend of the elbow, the palm of the hand, the navel, the genitals, the inguinal region, the ham, and the sole of the foot. Nevertheless, a very copious desquamation ensued on the other parts of the skin, exempt from the variola and covered with ichthyotic masses; so that, by this means, the scales belonging to the ichthyosis were thrown off, and they did not again make their appearance. I saw this patient during his attack of variola in my small-pox wards, and also fifteen years later, when he again received admission into the wards for skin diseases placed under my direction, for an attack of scabies, and I was therefore able to convince myself of the non-appearance of the ichthyosis. Neither scaliness, nor pigmentation, nor thickening of the skin was to be detected on the patient, so that no one would have been in a position to recognise, from his then condition of skin, the ichthyosis which had been present fifteen years before.

Slighter grades of ichthyosis sometimes do not undergo any change, even when the disease has been of long duration. We know, therefore, that in the same proportion as used-up layers of epidermis, no longer capable of nourishment, are cast off, new ones are formed.

Higher degrees of ichthyosis, however, the so-called *I. cornea*, *Hystricismus*, have a different course. It is well-known that the higher degrees of ichthyosis develop from lower grades, since, in all cases, they at first show the condition of pityriasis, then the appearances of *I. simplex* or *nacrée*, and later, owing to thickening of the epidermic masses, those of *I. cornea* and *hystrix*. The only way in which this can be explained is, that the epidermis continually furnished from the papillary layer is

not cast off in the same ratio from the surface, but, on account of its capability of being longer nourished, is retained and so can increase to thick shields. At length, these shields and spines of *I. hystrix* and *cornea*, by conversion of their cells into horn, lose their power of imbibition and, consequently, of being nourished. The plastic material formerly appropriated to their nourishment accumulates in one of the layers of the thickened epidermis, and thus forms, as it were, a septum between the layers of the epidermis, become incapable of being nourished, and those which are still nourished. Hence, the former being necrobiotic, lose their connexion with the living parts and fall off, in the form of variously shaped shields and plates. According to the thickness of the layer thus thrown off, the rete mucosum will, in one case, appear laid bare, and, in another case, a moderately thick covering of epidermis will still remain behind, on the rete mucosum.

This occurrence has been wrongly named a "moulting process," for it has been asserted that the shedding in the more severe forms of ichthyosis, like that observed in the brothers Lambert, resemble the process of moulting in the lower animals. It is true, I have observed such a remarkable casting off of the epidermis, by some compared to "moulting," in the case of *Ichthyosis cornea* and *striata* described by me and figured in my Atlas (Taf. i. Heft. iii.). In two other cases, however, in two children in whom *I. cornea* and *hystrix* occurred on the palm of the hand and on the sole of the foot, in addition to similar changes on the upper and lower extremities, I have not observed any such extensive desquamation of scales, during an observation of several years.

In conclusion, we have yet to mention those cases in which ichthyosis occurs usually in circumscribed patches and accompanies other diseases of the skin. Thus, for example, in pachydermia and eczema chronicum of the lower extremities, and after cicatrisation of ulcers of the lower extremities caused by varicose veins, a considerable heaping up of epidermis on an hypertrophied cutis becomes developed. In such places, we meet with ichthyosis of all grades from the lowest to the highest.

Anatomy.—It is to be regretted that the anatomical, microscopical, and chemical investigations of the layers of the skin

altered by ichthyosis have not hitherto led to any satisfactory result. What we do know of the minute structural alterations in ichthyosis, we owe, for the most part, to the researches of Tilesius, Martin, Rayer, Gluge, Mason Good, G. Simon, v. Bärensprung, Er. Wilson, &c., and is summed up in what follows:—The scurf, scales, plates, protuberances, shields, &c., occurring in ichthyosis, consist of thickened epidermis, in which, besides the epidermic cells, certain authors have found a structureless mass, which does not occur in the normal epidermis (Gluge), and which appears arranged in very regular, circular layers. Others, as Bärensprung, found pigment deposited around the nuclei of the youngest epidermic cells in the form of molecular granules. Respecting the cause of the dark discoloration of some ichthyotic masses, v. Bärensprung asserts that it does not arise from the deposition of granular pigment, but from fat and particles of dirt which adhere mechanically to the fissured epidermis. E. Wilson says that the secretion of the sebaceous glands, which is altered in quality, and which accumulates in great quantity on the epidermis and dries up, leads to the formation of the scales and crusts of ichthyosis. All observers find changes in the cutis vera, the papillary layer especially being thickened, whilst the subcutaneous fat, on the contrary, is diminished. *See Kaposi's article - 1889.*

Chemical analyses of the ichthyotic products have been undertaken by Mason Good, F. Simon, Marchand, and recently by Schlossberger. Essential variations from the normal conditions of the epidermis were found. Thus, Mason Good speaks of the secretions of the skin containing an increased quantity of lime salts. Fr. Simon found oxide of iron and carbonates and phosphates of lime in the deep yellow-coloured ash obtained by burning the ichthyotic scales. Marchand also found, in addition to the above mentioned constituents, a considerable quantity of silicic acid, and an increase of the inorganic constituents altogether, so that they amounted to 15 per cent., instead of 1 to 1½ per cent., in the normal epidermis. Schlossberger's results also agree with these, for he found a remarkable quantity of silica and oxide of iron, and saw in this circumstance a resemblance to the bark of trees, in which there also appears to be much insoluble material deposited.

Etiology.—If by the term ichthyosis is understood that

peculiar disease of the epidermis which is generally diffused over the whole surface of the skin, but appears especially well marked on the extensor surfaces of the extremities, which, beginning within the first few years of life, remains throughout the rest of life, with greater or slighter fluctuations from better to worse, and consequently, on the whole, is continuously present on the patient; which, further, by appropriate treatment, can be modified and caused to disappear, if let alone, however, always becoming regenerated; then, there can be no doubt that ichthyosis, in this sense, always depends upon a congenital morbid condition of the papillary layer and abnormal formation of epidermis, and that we may therefore regard it as a *congenital* disease.

Since, however, there are likewise numerous cases which present the appearance of, and are consequently correctly designated as, ichthyosis, owing to the development of hypertrophic masses of epidermis only on certain regions of the body, chiefly on the lower extremities, in connexion with other disturbances in the nutrition of the affected organs, accompanied by enlargement of the papillæ,—we may, in this sense, speak, also, of an *acquired*, of a consecutively acquired, ichthyosis.

Usually, it is also true that the general ichthyosis is a congenital, and the partial an acquired disease.

In regard to the first, the congenital form, we have both had the opportunity of establishing its hereditariness, *i.e.*, the transference of the malady from parents to children, and also of seeing children affected with ichthyosis whose parents and ancestors, so far as their genealogy could be ascertained, had had no such disease. Moreover, the children of the same parents are variously affected. Thus, I knew one family in which five children were born of healthy parents. The two eldest, at the time of puberty, still had thoroughly clear skins, whilst the three succeeding ones suffered from ichthyosis in various forms and degrees in childhood, at the age of 5 or 7 years.

Hereditariness is the only cause of ichthyosis which seems to have any reasonable foundation, since both sexes, persons of various modes of life and position, of diverse constitution, of very different climates, races, &c., become affected with ichthyosis in equal proportions. Moreover, it is not yet certain

whether any disease, or physical and psycical influences which affect the mother during pregnancy, can produce ichthyosis in the children, if we do not place any value on the tales and fables, the purport of which is, that in the cases concerned the mother was "frightened" at the sight of fish. We have already spoken in another place of the absurdity of the so-called "fright" of the pregnant woman;* and in respect also to ichthyosis we must refer to what we have there said. On the other hand, it is easily explained why ichthyosis should be hereditary, especially in families where it has been handed down from parents to children in unbroken succession. We need only recal to mind that the children of the Ethiopians, of the Indians, and of the other races of men, resemble their respective parents in so far that they, as a rule, have a similar colour of the skin, if not immediately after birth, at any rate at an early period of life. Moreover, no one is astonished when the children of blonde parents are also blonde, but, if the contrary occurs, comment can scarcely be suppressed. If, therefore, in physiological processes, such a transmission of pigmentary appearances and of peculiarities of the papillary and epidermic layers is established; so, in like manner, the hereditariness of ichthyosis appears very plausible.

The cases of local ichthyosis occurring in old and young individuals, and caused by hyperplasia of the epidermis, are observed in consequence of chronic inflammation of the skin. As they, however, are wont to occur either independently, or as the results of inflammation and disease of the veins, lymphatics, &c., or, in other cases, in association with thickening of the cutis (*Pachydermia*, *Elephantiasis Arabum*), or other abnormal conditions of the epidermic layer (eczema, warty formations, &c.), it is evident, that while the more remote causes of such ichthyosis may be manifold, its essential cause is always the same.

Treatment.—In the treatment of ichthyosis, all those remedies are more or less successful which have the power of softening the epidermic masses accumulated in abnormal quantity, and, at the same time, exercise such an influence on the organ which begets the epidermis, the papillary layer, that by stimulation of

* See p. 20.

the formative process of the epidermis a more rapid removal of the superimposed thick layers may be brought about. By such a mode of treatment, we are undoubtedly able to separate the ichthyotic masses from the normally situated epidermic layers, and thus to expose these to view in an almost normal condition. But, sooner or later, the ichthyosis becomes re-established in its previous condition, because the same circumstances which originally produced it—that is, the peculiar morbid condition of the papillary layer and its abnormal method of performing its function—have not been altered. The indication, therefore, will be to act on the papillary layer in such a way that it shall furnish epidermis in physiological quantity and quality. But the experiments made with this view have not as yet been attended with success, since no internal or external remedy has been found capable of producing such an alteration in the formative processes of the epidermis.

From an early period, dermatologists have attempted to cure ichthyosis by iron and sulphur preparations (Alibert). Others have tried the internal use of *Pix liquida nigra*, from half an ounce to an ounce daily, in the form of pills (Willan, Fuchs, Bateman, Elliotson), or a decoction of the root of *Rumex acutus* (Anthony Todd Thompson), or antimonial and mercurial preparations (Turner). "*Specificum et unicum in hoc morbo remedium est decoctum ex cortice intermedio ulmi*," says Plenck after J. C. Lettsom ('*med. Nachrichten v. d. allg. Dispensatorio in London*, Altenburg, 1777, p. 131). Others have recommended alkaline remedies (magnesia), and, lastly, arsenic in particular, which was first recommended as a specific by an Englishman, and, after his example, was used by the physicians of nearly the whole world, without, however, their meeting with any success by its internal employment, alone, in ichthyosis; no more, in fact, than by the employment of any of the other means mentioned. We see, therefore, that we can only rely on external remedies.

A large number of the local remedies which have been already cited, at various parts of this work, as emollient and capable of dissolving and destroying the epidermis, will, also, in ichthyosis fulfil the same ends. Baths, especially, in every form, ordinary, vapour, peat, mud or sulphur baths, and those containing brine, are followed by good results if they are continued long enough and the water used be in a "soft" condition. "The

cold-water cure," however, is less fitted for this purpose. Frictions with fatty oils are employed either alone or alternately with the baths before mentioned.

Soap acts still more effectually, especially soft soap, and we can make use of the treatment fully indicated at pp. 35 and 153, vol. ii., in its entirety in this affection. Of the medicated soaps, the iodide of sulphur soap is especially praised; its action is, however, inferior to that of soft soap. I have no preference for the preparations of tar, praised by some, in the treatment of ichthyosis.

We arrive at a successful termination most expeditiously if we use a combination of treatment, at any rate in the manner subjoined. We first of all rub the patient with soft soap twice daily for six to twelve days, and place him, naked, between blankets till the epidermis begins to peel off in large lamellæ. Then the patient has a bath daily for one or two hours, or, if possible, for a longer time, and anoints his skin with oil, or an emollient salve. By this plan, we can cause any ichthyosis to disappear. But, after a longer or shorter time, the epidermic covering will be reproduced in its former thickness.

This treatment, therefore, does not cure the ichthyosis, but only removes the superimposed epidermic scales. As we, however, know of no treatment which will prevent the reproduction of such epidermic masses, and the patient still wishes to possess a soft, supple, smooth skin, the continuous use of tepid baths and of fatty and oily inunctions will have to be persisted in. By this plan, success will at least be attained more surely and better than by caustic, painful remedies—vesicants, tincture of cantharides, croton oil, &c.

Prognosis.—From the preceding account, it follows that ichthyosis belongs to the incurable maladies. It, however, exercises no baneful influence on the general organisation by its long duration, and is neither accompanied by any special disposition to other internal or external lesions, nor does it exercise such a reaction on the animal economy that the organism becomes altered in any of its organs or functions whatever.

CHAPTER XXXIV.

(CLASS VI.—DIV. II.—KERATOSES (CONTINUED).)

HYPERTROPHY OF THE HAIR.

Hypertrichosis, Polytrichia, Trichauxis (from *Θρίξ, τριχός, Hair, αύξη, increase*).

By DR. KAPOSI,

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WHEN the growth of hair exceeds its normal limits, we designate the condition as Hypertrophy of the hair.

It is evident that we only speak of an increased growth of those hairs which are normally present, and, consequently, occur on the normal situations, that is, on any part of the surface of the body, with the exception of the palms of the hands and of the soles of the feet, of the dorsum of the last phalanx of the fingers and toes, of the inner surface of the labia majora, of the prepuce, and of the surface of the glans.

An excessive growth of hair is observed under very various conditions, and has, accordingly, been treated of by authors, sometimes from one point of view and sometimes from another.

Hypertrophy of the hair shows itself most frequently and most remarkably, in the form of a luxuriant growth of hair on parts of the body where, either at the time of life or in the sex of the individual affected, or at all times and in all mankind, only fine downy hairs (*Lanugo*) should normally be present. Here, therefore, belong the cases in which children are born covered with long hairs either over the whole body or over large tracts of the body—*Hirsuties adnata* (S. dasytes*), *Hirsuties universalis*, *Homines pilosi* (Eble), as they were named by

* From *δαρός*, thick, thickly grown over.

Thomas Ficinus,* Casper Peucerus,† Zacutus Lusitanus,‡ Scalliger,§ and others. With these are included cases in which a growth of hair is already developed in childhood which generally only occurs at maturity; children of 6 to 8 years of age, whose bodies appeared beset with long hairs,|| or who showed prematurely fully developed or unusually long hairs on the pubes or of the beard.¶

The hypertrichosis originating later in life (*H. acquisita*) is mostly confined to smaller cutaneous regions (*Hypertrichosis circumscripta*). It is well known that long, thick, and, for the most part, deeply pigmented hairs occur on smooth or warty mothers' marks (*nævus spilus*, *nævus pilaris*), and even on warts originating later in life.** The hairs of the beard, especially of the upper lip and chin, are now and then remarkably developed, even to monstrosity, in females. The case of Miss Pastrana, who was exhibited everywhere some years ago, is a striking example of what has been often witnessed. The persons affected are mostly such as have either never conceived, or are true viragos, with masculine characteristics in the build of the skeleton, demeanour, and voice. But a considerable development of the hairs of the beard often makes its appearance in young females and in those who have borne children, even during the period of full sexual power, mostly, however, not till after the climacteric period. Around the nipple also, in such women, we often see strongly developed, bristly hairs.

In certain individuals†† a stronger growth of hair occurs on those parts of the skin which from any irritation have for long been the seat of an increased nutritive process. Boyer, Rayer, Osiander,‡‡ and others have noted such, in which they saw remarkably strong and long hairs spring up on places which had become irritated by stimulating plasters or blisters, or which

* 'De Viribus imaginationis,' p. 224.

† 'Commentar. de divinatione,' p. 29.

‡ 'Praxeos. med. admir.,' lib. iii., obs. 91.

§ 'Exercitat.,' 114, s. 2, p. 427.

|| Gruner's 'Menschenfresser Goldschmidt.' Degner, in Acta Acad. nat. curios., T. vi., obs. 71. Rayer, 'Malad. de la peau,' iii. B.

¶ Hufeland's 'Journal,' 14 Bd., 1802, p. 41.

** Villermé in Rayer, 'Darstellung der Hautkr.' Berlin, 1839, iii. B., p. 320.

†† Loc. cit., p. 321.

‡‡ Gilibert's 'Sammlung praktischer Beobachtungen,' p. 56.

had been inflamed. I myself, under similar conditions, once found such an unusual growth of hair on the dorsal surface of the wrist and hand. A woman had phlegmasia alba dolens of the right wrist-joint after confinement. On account of the oedematous swelling, painfulness, and stiffness which had existed for months, after many other therapeutical measures had been tried, ten grains of the Unguentum cinereum (Ung. hydrargyri) were rubbed into the affected part daily for three weeks. After this period, the skin of this region was covered with remarkably long, downy hairs, in complete contrast to the very femininely delicate and smooth skin of the healthy hand.

Lastly, the unusually strong development of the hairs of the beard and scalp met with in certain individuals is also to be considered as hypertrophy of the hair. Now and then, individuals have created a sensation on account of a very thick and long head of hair. A man whom Rayer mentions, an athlete in build and stature, had an abundant head of hair, which, when lifted straight up, measured four feet and a half in circumference. Several years ago, another athlete (a Hungarian, Toldi János) exhibited himself, who could elevate his extraordinarily abundant and long hair as a gloireole around his head. I knew a young man from Presburg, of feeble build of body, who had a similarly rich head of hair, and who could elevate it, in the same manner as his athletic countryman, in the form of a hood, or could comb it down, like a hood reversed, from his head, so that the hairs, streaming downwards, diverging, and thickly set, concealed his whole countenance.

Anatomy.—Hypertrophy of the hair, according to what has been mentioned above, consists rather in the comparatively large number, being densely crowded together, and in the length of the hairs, than in the unusual size of individual hairs. Nevertheless, it is to be noted that, for the most part, the hairs which are unusually developed in number and length, as well as the hairs occurring in excessive development on nævi, on the lips, and on the chin in women, are, at the same time, remarkably thick, bristly, and stiff. In other respects, however, their condition does not differ from that of the normal hairs. Rayer mentions that compound hairs which are stronger than neighbouring ones are occasionally met with among the hairs of the

beard and of the head. These compound hairs are often split, and even consist of variously coloured hairs, which, after extraction, can be separated from one another by the aid of the tweezers. "They grow from united hair-sacs, which possess but one opening externally" (Rayer, *loc. cit.*, p. 324).

Cause.—Nothing, beyond what is suggested by the mere phrase, is known either as to the cause of Hypertrichosis connata and acquisita, or of the general hypertrophy of the hairs, or of that confined to certain localities.

The fables which are related by the older writers, in connexion with the congenital hirsuties from the "Versehen"* of pregnant women, and which are credulously repeated by Eble† (*loc. cit.*), are so silly that they are not even worth laughing at.

There are two influences, however, which cannot be passed over in silence. In the first place, now and then, as has been mentioned above, a local irritation of the skin will here and there produce a vigorous growth of hair. As Rayer especially mentions such facts, and as we, also, have undoubtedly observed such, local irritation may be regarded as an occasional predisposing influence of the vigorous growth of hair. It is also known that a local irritation of the skin may provoke a correspondingly excessive formation of epidermis. Consequently it is not altogether unwarrantable, physiologically, to assume that occasionally, from local causes of irritation, instead of the epidermis, or at the same time with it, the horny tissue which constitutes the hair can also be produced in excess.

In the second place, certain pathological changes in the

* Vivid mental impression (fright, &c.) from *looking*. (See *infra*.)

† As Eble, on account of his work, 'Die Lehre von den Haaren in der gesammten organischen Natur' (Band. 2, Haare des Menschlichen, Vienna, 1831); is so often quoted by all writers, we cannot abstain from adding here a few specimens of his production. "In my country," he writes, "according to the testimony of a friend very worthy of belief, a countrywoman gave birth to a child who had a white, downy beard, because the woman, during her pregnancy, was once violently alarmed by the lathering of her husband's beard." Eble also mentions, with reserve, that Thomas Ficinus had seen a young woman who was born covered all over with hairs and bristles; because the mother, at the time of her conception, had regarded too earnestly a picture, which hung over her bed, of St. John the Baptist, who had on a garment of camels'-hair; and that the aunt of Pope Nicholas III. gave birth to a similar child because she was very frequently in the habit of looking at a bear in the family coat-of-arms.

organism stand in causative or reciprocal relation to an excessive growth of hair. It cannot be denied that among women it is mostly sterile persons, or viragines, or such who have passed the climacteric period, in whom the excessive growth of the beard is observed. We must therefore consider the growth of the beard as a manifestation that the organic development of such females tends rather to the masculine character, just in the same way as we view the stronger bony framework of such persons, their deep voices, &c.—briefly, their generally “masculine constitution.”

On the other hand, we do not believe that an unusually vigorous growth of hair on the trunk, or, as is asserted in many quarters, of the beard and of the head, is a prognostic, or an accompaniment of a tuberculous, scrofulous, cancerous, &c., cachexia.

We need only look at the examples given, to prove that such a coincidence of abundance of hair and cachexia is merely accidental. The athlete mentioned by Rayer had no sort of cachexia; neither had the man Toldi János, mentioned by us, shown a disposition to any such condition. We recollect, on the contrary, a young man whom we had under care, when 6 years of age, with caries of the knee-joint and of the bones of the leg, and whom we had under observation from that time till his death at the age of 22. He was almost beardless, though the other male members of his family had a very abundant growth of beard. We have also met with a case which might mislead us in the direction of the opinion of the authors mentioned above, were it not that, on the whole, it stands in too isolated a position. The young man from Presburg whom we mentioned, who possessed such a gigantic growth of hair on his head, and who, till his thirtieth year, was in excellent health, had, at that time, an attack of hæmoptysis. The attacks recurred, and he died three years later with manifestations of pulmonary tuberculosis.

Treatment.—For the Hirsuties adnata, which mostly occurs on the trunk and on the extremities in the form of an abundant lanugo, no successful or rational treatment can be undertaken. These hairs, moreover, are seldom of permanent duration, but, as a rule, fortunately fall out in the course of the further growth of the child, and are then replaced by woolly hairs of normal

length. Generally, we are only in a position to attack the circumscribed polytrichiasis, the remarkable hairy growth on warts, and the hairs springing up in excess on the chin, upper lip, and, briefly, the face of females.

If we have merely to treat isolated, not very extensive, warts which are covered with hair and therefore disfiguring, then it is most desirable to destroy the warts themselves in the regular way by means of evulsion, excision, and cauterisation. By this plan, the hair follicles are at the same time destroyed, and the growth of hair on these places for ever abolished. The scars remaining after such operations become, by careful treatment, so superficial that they are scarcely perceptible, at any rate in comparison with the hairy warts.

We must adopt much less radical measures, however, when we have to deal with the removal of hairs growing from the normal skin of the face of women. Epilation of each hair, followed by destruction of each follicle by means of red-hot needles, is such a very painful proceeding, and leaves behind so many scars corresponding to the individual hair-sacs, that the removal of the hairs in this manner can scarcely be satisfactory. These hairs, therefore, can only be temporarily got rid of, either by shaving them daily, or by pulling them out as often as they grow again, by means of ciliary forceps.

Shaving by means of lathering and a razor is less efficient, because after shaving, the hairs merely cut off at the level of the skin still show their stumps as black points at the apertures of their follicles. This does not give a pleasing appearance to the skin of a lady, and the smooth complexion hoped for is not well attained by this plan, even by very careful and uniform shaving by means of a sharp razor.

Perhaps a paste, which is still at the present time employed by Orientals in the baths, and by orthodox Jews for the removal of the beard, answers better. This paste consists of a mixture of orpiment (*Auri pigmentum*, sulphide of arsenic) and slaked lime, both of which are rubbed up with water into a thick pap of reddish colour and then boiled. The reddish colour is thus changed into a dirty green. Sulphide of calcium, which is obtained by passing sulphuretted hydrogen through slaked lime, acts still more quickly. One or other of these pastes is laid on the hairy parts by means of a blunt, flat piece of bone

or wood (spatula), to the thickness of a line, and left for eight or ten minutes. Then, this is scraped off with the blunt edge of a knife, and the skin cleansed by means of lukewarm water. Lastly, a weak zinc ointment is rubbed in over the somewhat reddened patch of skin, and some powdered rice or *Pulvis aluminis plumosi* (*Federweiss*) is sprinkled over, or we touch the parts, in order to make them white and supple, with the princess'-water, without metallic constituent, given by Hebra (see p. 25), which contains *Talcum venetum pulverisatum* in a moist, pappy condition. The aromatic and alcoholic fluid (*Spiritus lavandulæ cum aquâ naphæ*), over the sediment, evaporates, and the fine powder fills up the pits of the mouths of the hair follicles, whilst the superfluous powder falls off or is wiped away. In this way, the irregularities of the skin are best made smooth, and the brown and black points best concealed.

As the paste destroys the hairs not only at the level of the skin but, also, partly in the follicles, they do not grow again so quickly as after mere shaving with a razor, when the short hairs have often visibly grown even within a few hours. For this reason, the paste only requires to be applied every two or three days.

For the removal of single hairs causing disfigurement, epilation is always to be recommended as the best treatment.

CHAPTER XXXV.

(CLASS VI.—CONTINUED).

PLICA POLONICA (DR. KAPOSÍ).

(*Weichselzopf*, *Koltun* (Polish), *Wichtelzopf*, *Trichoma*.)

THOSE of our professional brethren who are intimately acquainted with the views of the Vienna dermatological school will justly be astonished that, in a place which should be devoted to the gravest scientific discussion, we treat of plica polonica, which long ago ceased to have any existence as a *disease* in the natural history of medicine, and, for decades, has been transferred from the pathological series to that of artificial, mechanical products. It is evident, however, that the excellent works of Beschorner,* Hamburger,† and Dietl,‡ on plica polonica have remained unknown to a large part of the medical world and even to specialists of note, probably because they were published in the form of monographs or scattered in periodicals. In no other way could it happen that dermatologists skilled as eclectics (Devergie), or renowned for personal experience and extensive reading (Er. Wilson§), still, in their latest works, treat of plica polonica in just as loose and ontological a manner as it was formerly dealt with; and that, lately, certain authors, as Butzke,|| Levisseur,¶ and others, both orally and by writing,

* 'Der Weichselzopf —,' v. Dr. Friedrich Beschorner. Breslau, 1843.

† E. Hamburger, 'Über die Irrlehre von der Plica Polonica,' Günsb., Ztschr., ix., Hft. 3, p. 162; und 4, p. 279, 1858; und verm. Separatabdr. tit. eodem. Berlin, 1861.

‡ 'Wiener med. Wochenschr.,' 1863, No. 47u. 48.

§ 'On Diseases of the Skin,' 1867, p. 746.

|| 'Denkschrift über den Weichselzopf. Ein Beitrag zur Begründung einer rationellen Pathologie und Therapie desselben.' Thorn, 1858; Berlin, 1859.

¶ 'Fragment zur Nosologie des Weichselzopfes,' Deutsche Klinik, 1859, 38, 39, 41, und 1861, 36.

have asserted the existence of a "plica polonica dyscrasia." It therefore seems to us advisable to reconsider the subject, not that we have anything new or essential to add to the well known arguments against the existence of plica polonica, but because we can bring these, in conjunction with Hebra's and our own experience, within the reach of a larger circle of readers by means of these pages, and, therefore, believe we can contribute somewhat to the general enlightenment.

For several centuries past, plica polonica has been regarded as a very mysterious disease, both by the laity and by physicians, in Galicia, Posen, Poland, on the banks of the Weichsel and of the Dnieper, in the Ukraine, Lithuania, Bukowina, Podolia, Silesia, &c. It occurs in these places endemically. Sporadically cases have been and are met with in Hungary, Moldo-Wallachia, the south of Russia, and in the South Sea Islands.

By the term plica polonica, has always been and is still understood a felting and matting of the hairs, mostly of the hairs of the head, less frequently those of the beard and pudenda. The hairs of the head appear rolled together into an "inextricable" ball of varied size and shape. It is mostly situated on the vertex, but, when large, invades the adjoining parts, and may even cover the whole of the hairy scalp. According to its shape, writers have described plica polonica as symmetrical, wedge-shaped, sickle-shaped, hanging down in a spiral, in the form of a curl, or of split queues, and have classified it as male trichoma (plica mas., cirrosa, Plenck*); whilst, on the contrary, they designate as the female plica polonica (plica femina, s. villosa, Plenck, and plica filia) the cap, turban, nest, cake, and such like forms of entangled masses of hair. Alibert, for example, has devoted no fewer than five plates of his Atlas† to the pictorial representation of the different forms of plica polonica. These are—plate 6, Plique multiforme; plate 7, Plique congeniale; plate 8, Plique en masse; plate 9, Plique solitaire; and plate 10, Plique du pubis. Plica polonica can also occur in the most varied and remarkable shapes; for example, forming a series of

* 'De Morb. Cutan.' Viennæ, 1783, p. 131.

† 'Description des Maladies de la peau.' Paris, 1814.

tiers, since two or three cake-shaped felts of hair appear laid over one another, and are separated from one another by smaller or broader zones of smooth (not felted) hair.

The length, as well as the bulk, may attain considerable dimensions, so that queue-like trachomata of the scalp may reach down to the knee, and those of the pudenda to the ground, or may be entwined around the thighs of the bearer (Hain).

If we take the trouble to examine such a felted mass of hair more closely, we shall find the hair appears, for the most part, without any gloss, as if dusty. The mass emits a penetrating, disagreeable odour, which may be compared to that of fatty acids, though some authors have fancied that it has very remarkable resemblances. In by far the greater number of cases, there are swarms of *pediculi capitis* in *plica polonica*. There are also multitudes of nits which adhere to the hairs. Finally, if we separate the hair with the finger and expose the scalp to view, it is found to be moist and greasy to the touch, in places covered with epidermic scales (hence the *dry* and *moist* *plica polonica* of authors). Here and there are pustules, small or larger *furunculi*, crusts of dried blood and pus, excoriated, moist, or somewhat bloody parts from scratching; in short, all the signs of *pityriasis* and of *eczema artificiale capillitii*, such as are met with in all persons who have been affected with *pediculi capitis* for a long time.

v. Walther* and Günsburg† have on one occasion also found fungus in *plica polonica*—the former, among the hairs, the latter, between the root-sheath and the shaft of the hair, and in the latter itself. Such a fungus has not been observed since.

NOTE.—The occurrence of fungus would be in no way remarkable, as such various foreign substances are contained in the *plica polonica*. *Herpes tonsurans* or *Favus* may also be present in some cases. But, it is not by any means allowable to regard *plica* simply as “common ringworm,” of the English. *Er. Wilson*‡ could never have arrived at this opinion had he had an opportunity of seeing a *plica polonica*.

If we add, further, sundry other foreign substances intro-

* Müller's 'Archiv f. Anat.,' 1844, s. 411; und 1846, s. 149.

† Idem, 1845, Heft 1, s. 34.

‡ 'On Diseases of the Skin,' 1867, p. 746 (*Trichonosis plica*).

duced accidentally or purposely into the felted mass of hair—feathers from the bed, amulets, wax, honey, and other sticky substances, vegetable fibres, cotton, dust of every sort, fragments of insects, &c.—we shall then have enumerated all the essential features which could be detected by the most scrupulous, and at the same time unprejudiced, investigation of plica polonica.

From what causes and in what manner does plica polonica originate?

Plica polonica originates, under all circumstances, simply from neglect of the use of the comb. Not one, even, of the most ardent theorists about, and believers in, plica polonica has ever reported a single case which had developed in spite of the regular and frequent use of the comb.

If so comparatively simple an affair as the neglect of the use of the comb can be considered as the sole cause of plica polonica, it appears to be somewhat marvellous how it happens that plica polonica can prevail to such an alarming extent in certain countries ("endemic"), that, for example, according to official returns, in the year 1842, in the Grand Duchy of Posen, alone (without the larger states), plica polonica was met with in 2,460 males, and 2,867 females, making a total of 5,327.*

The mystery of the phenomenon disappears, however, if we consider more closely the circumstances under which the individuals affected, persistently, for many years, wholly neglect the use of the comb, and so, accidentally or purposely, become attacked with plica polonica.

They may be distinguished, according to their intrinsic value, as of three sorts:—

1st. People do not comb their hair, because, in consequence of their low degree of culture or their mental condition (*Geisteskrankheit*, insanity), they do not consider the use of the comb necessary, or they consider such felted hair as an ornament to the head. In the latter case, as in those to be mentioned later, all sorts of adhesive substances and foreign bodies are employed to make the felting of the hairs thoroughly complete.

From such causes, we meet with isolated cases of plica polonica in every country and climate.

* Beschornier, loc. cit., p. 11. See his Table.

NOTE.—Thus, Richter reports, in *Med. Jahrb.*, lxxxvi. 116, on the custom of certain South Sea Islanders of wearing the hair felted together as a head-dress, and quotes Klemm (*'Kulturgesch. d. Menschheit,' Leipzig, 1843, B. 1, 304*) and Freycinet (*'Voyage autour du monde, vol. ii., p. 727'*): "The long hair of the Australians is never disturbed by the use of a comb. The general custom is to smear the hair with grease and sprinkle on ochre. With the aid of the yellow resin of trees, they glue in their hair, teeth, fish-jaws, bits of wood, birds' feathers, dogs' tails, &c., &c. The dwellers on the southern shore of Botany Bay part the hair in small strips (like wicks—*mèches*), and stick these together by means of a resin, so that they hang down all round the head like so many tails."

Forster (*'Reise um d. Welt,' Berlin, 1784*) reports in a similar manner respecting the hair-dressing of the Tanna Islanders; Berghaus (*'Volker der Erde,' Leipzig, 1847*) respecting the enormous head-dresses of the Australian negroes; Surgeon Ellis, respecting the hair of the Tasmanians glued together in clumps (*'Beschr. der dritten Cook'schen Reise,' Frankf. und Leipzig, 1783*); and others.

2nd. People neglect the cleansing and smoothing of their hair for a long time, because this manipulation causes them much trouble and pain. This relates to all cases in which the hairy scalp itself is inflamed in a diffused or circumscribed manner, and a secretion exudes in consequence, which, on drying, glues the hairs together, and favours their felting. It is chiefly, therefore, moist and impetiginous (pustular) eczema of the hairy scalp, syphilitic and scrofulous ulcers, caries and necrosis, and frequently recurrent erysipelas, favus, and similar affections of the scalp, which lead directly to the neglect of the use of the comb. The hairs stick together and become felted owing to the dried-up secretion of the eczema, of the pustules, or of the ulcers, and every awkward attempt to loosen them, especially by the use of the comb, is very painful to the patient, on account of the inflamed condition of the scalp; and more so, because not only are the hairs pulled, but also the teeth of the comb wound the skin, so as even to cause bleeding, &c. The patients, therefore, completely neglect the use of the comb either from sensitiveness or from indolence.

Under these circumstances, we meet with isolated cases of plica polonica everywhere.

3rd. People do not make use of the comb, because, from prejudice, superstition, or their judgment being influenced by popular belief or erroneous medical inference, they consider the appearance and continuance of the plica polonica

as beneficial or necessary to their bodily or mental recovery and health.

From the reports of the vast number of cases of plica polonica which have been observed, amounting to thousands and thousands, it is evident that the circumstances giving rise to this idea are of a twofold character.

In the first place, an individual is prostrated for many months or years by a severe, chronic illness—chronic rheumatism of the joints, gout, marasmus after typhus, lingering typhus, scorbutus, arthritis, tuberculosis, caries of the vertebræ, dropsy (Morbus Brightii), syphilitic ulcerations, ulcer of the leg (Ulcera cruris e varicibus, e carie ossium), puerperal processes, peritonitis, &c., &c., &c. During their long illness, the persons affected are generally badly nursed, and also not combed. The hair becomes felted in proportion to the length of the hair itself (consequently most frequently in females), and to the duration of the confinement in bed. It is well known how, even after a week's illness, for example, a somewhat abnormal confinement, or after pneumonia, the hair of a female patient may become so exceedingly entangled that it takes many hours to make it smooth. Still more so, if pediculi capitis are present. These excite itching and cause the patient to scratch, in consequence of which excoriations, pustules, and suppuration are developed, and afford materials for the gluing together of the felted hairs. After some months, the joint-rheumatism, or the peritonitis, or the chronic illness has reached its termination, after going through its natural course, or has entered on a stage of convalescence. The patient leaves his sick-bed convalescent or cured, and then the extraordinary felting of the hair, the plica polonica, which was not present before the illness, is noticed. From this series of events, popular logic, and the logic of the physician, deduce the *post hoc ergo propter hoc*; and it is argued: as the individual was prostrated by a severe illness and did not recover for so many months, in spite of every medical assistance, but, at last, recovery occurs—with the simultaneous development, however, of the plica polonica; therefore the plica polonica must have been hidden in the body for the whole of the time, and has shown itself as feverishness, loss of appetite, pains of all sorts, profuse sweating, emaciation,

danger to life, &c., until it was brought out by the vis naturæ, externally, when all bodily ailments must end. From this, it followed, naturally, that the plica polonica, "begot with pain," was regarded as a friend in need, was cherished, saved from destruction by protective hoods, and the attempt to cut it off and remove it was regarded, on the contrary, as a warring against nature, as an attack on life itself, because the plica polonica, if not sufficiently taken care of, might either wholly depart again, or attack the internal organs and endanger the life of the sufferer. Thus it occurred that in the statistical return furnished by the Commissioners in Posen, in the year 1842, instances were met with in which individuals had been affected with plica for fifty or sixty years.

From this view of the causal relations of plica, it followed, also, that physicians regarded, and still regard, all the symptoms formerly indicated (such as weakness, loss of appetite, all sorts of depraved appetites ("sub picâ latet plica," said the Polish physicians), dropsy, want of breath, stitch in the side, emaciation, &c., &c.), belonging to the most different diseases, as symptoms of the plica-disease, whilst, really, when correctly understood clinically, they only indicate the existence of well known diseases of certain organs, such as of the kidneys, lungs, heart, joints, &c.

Secondly, the obverse of this false conclusion also necessarily existed. If any one suffered from an obscure disease, or even a manifestly chronic malady, for example, chorea, epilepsy, cancer of the stomach, or carcinoma of the breast, and which, consequently, no treatment would modify, then it must be the plica polonica which has "entered into the body," or the patient has been "cursed," or "bewitched," and the plica polonica, by its efforts to escape from the body, caused therein all sorts of pains, or threw him into convulsions, cramps, &c. (hysteria, chorea, epilepsy, mania). It was, consequently, necessary to assist the plica polonica—it must be enticed to come out, or even be artificially developed.

NOTE.—They even made use of it as a means of diagnosis. They took a tuft of hairs from the sick person or from another individual, or even from one of the lower animals, tied them together, and laid them over the pit of the stomach. If they became curled up in the course of three days, then it was the plica polonica, which was concealed in the body and must be enticed out.

In fact, even at the present time, we still meet with persons who, acting on the advice of friends, and, *sub auspiciis* of physicians, wear a plica polonica under similar circumstances. Nay, persons whose hair is too short to become tangled into a plica, obtain a plica polonica made up of foreign (!) hair (Herzog). We knew a lady who suffered from an enormous medullary cancer of both breasts, and of their neighbouring parts. As her condition did not improve, at last she wore a small plica polonica on the crown of her head, and concealed it under a cap and washed it daily with a decoction of sabadilla, "so that no lice should infest it." She died in spite of and with her plica.

From this representation of the actual state of things, it is therefore evident :

1st. The plica polonica is nothing but a mechanical felting of the hair, caused by neglect of the use of the comb, whose occurrence is merely favoured by adhesive materials, such as the products secreted by eruptive and ulcerative processes on the scalp. The appearances which belong to the plica polonica, as such, and also the "shedding" ("Abwachsen," "Abfallen"), and the "bleeding" of the plica polonica, are to be explained only and fully by its mechanical origin and by the *κατ' ἐξοχήν* local conditions.

2nd. Plica is, therefore, not a disease, consequently not a *morbus sui generis*, and cannot excite symptoms of reaction in any organ or system of the body, nor be produced by changes in the body.

3rd. Neither is there any dyscrasia plicosa, nor any nosological symptomatology of plica polonica. The appearances which have hitherto been ascribed by authors to the supposed, but non-existent plica dyscrasia, can, at any time, either at the bedside or on the *post-mortem* table, be shown to be symptoms of well known organic diseases—*morbus Brightii*, uterine affections, carcinoma, syphilis, vitia cordis, &c., &c. They have no organic connexion whatever with the plica polonica.

4th. The division of plica polonica by authors into a *trichoma vulgare verum*, which stood in intimate causal connexion with organic bodily diseases, and a *trichoma spurium*, which was

caused by local mechanical conditions, has no value whatever, since every trichoma, in that sense, is "spurious."

5th. Therefore, the spontaneous "shedding" ("Abwachsen," "Abfallen") of the plica polonica as well as its "growth" ("Anwachsen") cannot have any "critical" significance as regards the body and its conditions. And, lastly,

6th. The forcible mechanical removal of the plica polonica cannot exercise any influence whatever, either in a good or a bad sense, on the general organism or on any internal organ whatever. Consequently, it does not produce any "plica metastasis."

In fact, at all times there have been a few judicious and unprejudiced laymen, possessing a right conception of the nature of plica polonica, who have attacked it successfully, by insisting on the use of "scissors and comb," with the best results.† The most important services in connexion with plica polonica have been rendered, on the whole, by Beschorner, Hamburger, Dietl, and Hebra; by the latter, orally and by his writings; by the former, by their laborious investigations and highly practical works, which we have already mentioned, but will here again allude to, rather than to the very large number

* Plica polonica may be "shed" spontaneously ("Abwachsen," "Abfallen"). This is to be explained in the following way:—In the normal condition, a continuous change of hair occurs. The hairs which have been shed are removed by the daily combing. In plica polonica, combing being discontinued, the shed hairs remain, lying with and becoming felted with the rest of the hair. After months or years, a new growth of hair occurs, whose individual elements do not become felted, because the cause which would make them do so, an eczema, for example, is no longer present. At this time, nearly the whole or the greater part of the hairs, which are rolled up together, belong to the "shed" hairs, and it is therefore evident that from being pulled or moved, during sleep in the night for example, they glide along the smooth, fresh-grown hairs, and are shed in rolled-up masses. This is the "shedding" ("Abwachsen" and "Abfallen") of the plica polonica. In the same way may be explained the origin of tier-forming plica polonicas, in which zones of smooth hairs lie between the plica-balls; because, at times, no cause for the felting of the hairs was present, and the latter grew smoothly. Then, again, a period of felting was interposed.

† The teacher Stieff, in Kaczkower-Rojewerdorf, deserves prominent mention in this place. He has, within ten years, completely rooted out plica polonica from that locality, solely by inculcating cleanliness. In the Inowraclawer district, in the year 1837, there were 100 plica polonicas found amongst the recruits; in the year 1842, only eight.

of old and of modern authors, who, in reference to plica polonica, still inculcate scientific superstitions.

In the Vienna school, as the scabies dyscrasia could not withstand Hebra's keen logic, so, also, manifestly, the plica dyscrasia and plica polonica could not hold their own. Every year we have the opportunity of seeing some cases of plica polonica. Their aspect and causes are always the same. The individuals are mostly such who are affected with pediculi capitis, and have given rise to the plica polonica by neglect of the use of the comb, or such who endure it "in good faith," on account of some existing disease. We have invariably removed the plica polonica, and have never seen any ill result therefrom. We do not believe that the scalp accustomed to the warmth of the plica-covering, and suddenly exposed to the air after the removal of the plica polonica, will "become chilled" ("erkälten") and diseased, and that we must on that account be "cautious" in taking away the plica (Beschorner). We have not seen any such local ill consequences from its removal.

The removal of the plica polonica is most easily effected by means of the scissors. We have never seen the wonderful "bleeding" of the plica hairs, which some authors mention, but which a medical man acquainted with anatomy cannot in the least credit. If there were bleeding this would come from the wounded scalp, cut by the scissors.

We can, however, also unravel the plica polonica and therefore need not necessarily cut it off. The former is under some circumstances very desirable, for example, in a lady, since she can then retain her long hair in spite of the removal of the plica polonica. For demonstration in the Clinique, nearly every year one of the cases of plica polonica which come under care is treated by unravelling. Our nurses accomplish this troublesome and tedious business in the course of twenty-four hours. The mass of the plica polonica is, first of all, saturated by pouring oil freely over it. If lice are present they are treated with petroleum, which immediately kills them. We must, however, be careful not to bring a light near on account of the very inflammatory nature of the petroleum. When the plica polonica is sufficiently saturated with oil, we then begin the manipulation of the unravelling by separating and loosening with the fingers the hairs glued together in small tufts,

till the individual hairs appear separated to the utmost, and then, only, we begin to smooth the hairs by means of a wide-toothed comb. We always take thin tufts only of hair between the teeth of the comb at once, and begin to smooth the hairs only near their free extremities. Thence we gradually approach the deeper part of the entanglement, which becomes much looser as the hairs at the circumference become smoother. Finally, the whole ball is unravelled by patient continuance of this manipulation—the plica polonica has vanished. What an unpleasant surprise, however! The individual who had been wearing a bulky plica polonica of the height and circumference of an Armenian bishop's mitre is introduced for inspection, and shows thoroughly smooth hair, but of very moderate length and thin (little of it). The great bulk of the plica merely consisted of hairs already shed from their follicles, and has simply been removed by combing. We ought, therefore, to make the patients acquainted with this circumstance, that they cannot expect, after the unravelling of the plica polonica, to possess such a luxuriant growth of hair as the bulkiness of the plica polonica appeared to show.

CHAPTER XXXVI.

(CLASS VI.—DIV. II.—CONTINUED).

HYPERTROPHY OF THE NAILS.

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Onychia, Onychogryphosis, Onychauxis.

INCREASE of the nail beyond what is normal, in bulk and circumference, may be designated as hypertrophy of it. We must note, here, that among the hypertrophies we include the mere increase of volume of the nail, which is not occasioned by abnormally increased formation of nail substance, but arises from wide separation of its elements ("Aufblättern"); inasmuch as, clinically, the increase of size of the nail appears as hypertrophy.

With the increase of the substance and volume of the nail is associated, also, a more or less manifest change in its structure, consistence, colour, and shape. The clinical character of hypertrophy of the nail depends upon a combination of all these factors, and can therefore vary as much as the combination itself.

If the nail grows of unusual length from neglect of regular paring, as is the custom among certain nations (Mongol Princes, South Sea Islanders), we cannot then call it hypertrophy of the nail. When their further growth is not interfered with, the nails often curve downwards in front, in the form of a claw. We meet with nails, however, which are distinctly hypertrophied in superficial extent, as if the nail-bed were too small for them, and which, therefore, not only pass forwards beyond the limit of the finger (or toe), but also spread laterally, further than normal, and their lateral borders press into the cutis of the nail-fold. The latter condition represents the so-called "*in-grow-*

ing" of the nail, which may give rise to considerable pain, swelling, inflammation, and suppuration of the portion of skin forming the nail-fold and its neighbourhood (*Paronychia*). At the same time, the front and lateral margins, as a rule, curve inwards.

At another time, the substance of the nail is thickened throughout, most considerably, however, in front, whereby the nail obtains the shape of a chisel with its thick base turned forwards. Or, the thickening chiefly affects the middle portion of the nail, so that it is elevated in the middle of its dorsal surface in the form of a cone or wedge, or is raised in a shapeless hump. Such a wedge or hump is often continued in a long, straight, or curved, tap-shaped excrescence, which appears like a style, round or flattened, resembling a bull's- or ram's-horn, straight, or twice or thrice twisted (*gryphosis onychogryphosis, curvatura unguium*—Virchow, Fuchs, and others). Moreover, owing to increase of size and thickness, the nails may assume the strangest forms, which are described in more or less detail in the various works on pathological anatomy (Rokitansky,* Gustav Simon†), and also in works on skin diseases and the monographs of Besserer,‡ Fuchs,§ Frank,|| &c., devoted especially to the abnormalities of the nails. We content ourselves with the citation of these authors because they, and also the long series of the older writers, from Hippocrates and Dioscorides to Morgagni, Plenck, and Alibert, describe the objective appearances of the diseases of the nails, and especially hypertrophy of the nails and its accompanying symptoms, in much the same manner.

In reference to the theoretical explanation of the changes, nearly all the writers quoted, however, with the exception of the anatomists among them, are so far behind the histological and pathological conceptions at present justified that we had better leave them out of the question.

The nails which are abnormal in their size and shape also appear variously altered on their upper and under surfaces.

* 'Path. Anat.,' 1856, 2 B., p. 89.

† 'Hautkrankheiten.' Berlin, 1851, p. 398.

‡ 'De Anatomia et Pathol. Unguium.' Bonnæ, 1834.

§ 'Die krankh. Veränderungen der Haut.' Göttingen, 1840, p. 50.

|| 'Die Hautkrankheiten,' Leipzig, 1843.

On their upper surfaces, they show parallel cracks and furrows, passing partly lengthwise, partly transversely over the nail, continuously, or interrupted in places; or the nail appears fretted on its upper surface, perforated with pits, as if bitten, or variously fissured. The tap-shaped, spiny, horn-like prolongations of the nails are either ridged in a parallel or converging direction, or smooth, or fibres separate from them in places. On the under surfaces, which are turned towards the bed of the nail, the hypertrophied nails are covered with thin, loose, moist or dry epidermic scales, not merely to the same extent as they overlap the finger-ends, but, also, further back, towards the matrix they are crumbly or coarsely lamellated. When looked at from below and in front, the front border of the nail appears turned up, lifted away from the bed of the nail and only partially connected with the latter by means of a coarse-celled, loose, lamellated stratum.

The consistence of the nails described is more or less altered. They are either uniformly or in certain places harder and thicker, or softer, thinner, and more flexible than usual, or even brittle, easily split up or pulverised. At the same time, they are generally more opaque than normal, and discoloured either partially or over their whole extent; dirty-yellowish, blackish-brown, and but little, or not at all, translucent.

As regards the number of the nails affected, the hypertrophy may attack either only one or several fingers, or all at the same time, in a more or less uniform degree of severity.

Anatomy.—The anatomy of the actually, or apparently hypertrophied nail-substance is of comparatively slight clinical interest, because there is nothing particularly instructive even in the histology of the normal nail-substance. It must be noted, however, that in the same proportion as the nail is thickened and less transparent, the individual structural elements of the nail, the nucleated, flattened, polyhedral cells, are brought into view with greater difficulty, more sparingly and less distinctly, by the usual reagents (concentrated solution of potash, ammonia).

Of more interest, and of greater importance as regards the comprehension of the development, and of the course of the hypertrophy of the nail, and, also, as regards its removal by

treatment, is the anatomical condition of the matrix and of the bed of the nail, which afford the material for the formation of the nail.

The nail proper, that is, the structure appearing as a compact, horn-like plate covering the dorsum of the last phalanx, is formed from the posterior part of the bed of the nail which is known as the matrix. Over the papillæ of the latter, the cells gradually become flattened and constitute the nail, here forming the root of the nail. As new elements from the papillæ become pushed forwards, the nail is pressed forwards along its bed. On the bed of the nail, the cells of the mucous layer also become flattened into epidermic lamellæ, which, however, are only added to the plate of the nail from below, as the latter is pushed forwards over them. A growth of nail-substance, therefore, takes place only from the matrix, that is, from its papillæ; and, in the same way, a hypertrophy of the nail can only arise from this source. The epidermic formation of the (front of the) nail-bed can only exercise any influence on the condition of the under surface of the nail.

In fact, just as in all situations where an excessive formation of epidermis, and particularly an excessive heaping up or deposition of epidermis occurs, so, also, in hypertrophy of the nail, which likewise represents an aggregation of epidermis, we can demonstrate an enlargement, that is, swelling from hyperæmia, or an actual tissue hypertrophy of the papillæ of the matrix or of the bed of the nail, and according as this papillary enlargement is transitory (from hyperæmia) or more lasting (from infiltration or hypertrophy), so also will the analogous change appearing as hypertrophy of the nail be transitory or persistent. A hypertrophy of the papillæ of the matrix always causes a compact thickening, a conical, tap-shaped, horny outgrowth of the nail-plate, whilst the analogous disease of the papillæ of the bed of the nail produces merely a thickening of the front part of the nail, and in such a manner that a lamellated mass of epidermic cells is added to the nail from below, and, therefore, the latter looks thickened from the front, but loosened from below, and the nail-plate itself appears turned up or raised from its bed.

At the commencement of the process, as in the cases of transitory hypertrophy of the nail, the enlargement or swelling

of the papillæ, which has been mentioned, can certainly be demonstrated clinically, but it is difficult to show it anatomically. We are no better off in regard to hypertrophy of the nails than in regard to other similar affections of the skin, for example, in psoriasis. Here we see, by clinical observation, the papillæ swollen and elevated from hyperæmia, and consider this condition of the papillæ as the proximate cause of the bulky formation and accumulation of epidermis characteristic of psoriasis. After death, however, the symptoms of the swelling of the papillæ have disappeared.

It is different as regards the chronic processes of excessive formation of epidermis, for example, in *Ichthyosis hystrix*, where we have demonstrated marked papillary hypertrophy.* And the like may be demonstrated in those cases in which the nails become chronically enlarged and exhibit conical, tap-shaped, horn-like structures, as already pointed out by Rokitsansky,† and which Virchow‡ has discussed more fully. He found the ridges of the bed of the nail in *onychogryphosis* hypertrophied, pressed together, and studded with numerous papillæ, and each laminated mass showed a structure like that of cutaneous horns and ichthyotic masses.

The papillæ of the matrix may be so enormously hypertrophied as to project for more than three lines in height, beyond the surface and penetrate into the hypertrophied tap-shaped nail. We once (a few weeks ago) sawed off from each great toe of a man a nail two inches in length and twisted like a ram's-horn; the section being made at a height of three lines above the normal level. The external nail structure of the horn was crumbling. After cutting through it, we met with a soft, inner, tap-shaped process, which projected conically into the horn, was painful, and bled freely when cut through. On the cut surface of the radical portion remaining behind, a group of blood-vessels which had been cut across was seen distinctly, after the surface was dried, just as after the removal of pointed warts; and in the nail-horns which we have preserved, we could

* See among others Kaposi (Moriz Kohn). 'Archiv f. Dermat. u. Syphilis,' 1869, p. 417, Taf. 3, fig. 7.

† 'Pathol. Anatomie,' 1856, 2 B., p. 89.

‡ Virchow, Zur normalen und pathol. Anat. der Nägel in 'Verhandl. der med. phys. Gesellsch.,' in Würzb., 5 B., 1854.

likewise follow the loops of the blood-vessels of the papillæ for some distance.

The hypertrophied papillæ, therefore, in onychogryphosis, just as much as in papillary warts and in ichthyosis hystrix, form the framework which determines the shape and on which the epidermic formations are heaped on one another, in the form of layers or hoods; and the spines corresponding to the gigantic papillæ are so arranged side by side, that they form a thick cone or tap-shaped process, or a horn-like, roundish, or angular outgrowth—a cutaneous or nail-horn.

Etiology.—The causes of hypertrophy of the nails are very various. A congenital origin must be assigned to a few, for instance, those cases occurring in early youth, just as in the malformations of other organs. More frequently, an injury, especially mechanical pressure, which is chronically exercised on the nails, may be regarded as a cause of the onychauxis. Such a pressure is exercised on the nails of the toes by tight and strong boots. For this reason, the hypertrophy of the nails, especially in the form of onychogryphosis, mostly occurs on the toes, and, most frequently, on the great and little toes, which, being situated on the sides, are chiefly exposed to pressure from the boot. And, for the same reason, the deformities of the nails, described, occur chiefly in old people, in whom the mechanical pressure on the toes has acted for the longest time. The hypertrophy of the nail, arising from continual mechanical pressure, that is, an increase in the laminae of the epidermal nail-plates and the simultaneous hypertrophy of the corresponding papillæ of the bed of the nail, is analogous to the callous formations of the epidermis (Tylosis) produced by the same mechanical cause, by pressure, and to the hypertrophy of the papillæ occurring beneath the callosities and in their neighbourhood. So that the most essential histological agreement may be demonstrated between tyloma and clavus, on the one hand, and onychauxis and onychogryphosis on the other.

Numerous causes for the origin of the pathological deformities of the nails, described, are afforded by all those morbid affections of the skin which directly, or by their natural extension, produce pathological changes in the corium, and particularly in the papillary layer of the matrix of the nail, and

of the bed of the nail, by means of hyperæmia, exudation, and inflammatory or neoplastic cell-infiltration.

These affections may be enumerated as chronic eczema, psoriasis, pityriasis rubra (Hebra), lichen exsudativus ruber (Hebra), ichthyosis, elephantiasis græcorum (Lepa), and syphilis.

All these affections, in consequence of their localisation, or of their attacking the bed of the nail, can alter its papillæ in a similar way, and cause an excessive and irregular production of epidermis, just as on other parts of the body. This abnormal production of epidermis appears on the latter localities, in the form of scaly and scutiform epidermic accumulation, as in psoriasis, ichthyosis, lichen ruber, keratosis (*palmae manus et plantæ pedis*), tylosis of the palm of the hand and of the sole of the foot. On the matrix of the finger-nails, they, on the contrary, appear as hypertrophy of the nails, in the various forms previously described. The deformities of the nails which almost regularly appear in the course of the skin diseases enumerated, as soon as they have reached a considerable degree of diffusion, or have existed for a considerable time, are to be explained in this way. They improve and become aggravated in the same degree with the involution, and the recrudescence of these processes themselves. They appear to be natural consequences of the latter, as has been already represented. The more chronic the course of the skin disease which leads to the production of the excessive formation of epidermis, the more easily it causes hypertrophy of the nail by its localisation to the bed of the nail. A more acute affection of the papillary layer and of the corium does not produce this. By such, the nail is always shed; for example, in scarlatina, acute eczema, erysipelas, circumscribed pustules, and abscesses (*onychias*, *paronychia*); just as in these affections in other parts of the body, the epidermis usually peels off in its whole thickness and over large tracts, but does not become hypertrophied.

In all these cases, therefore, in which we are able to specify the proximate and predisposing causes of the hypertrophy of the nails, we must avoid all grounds of explanation which lie in the foggy dominions of humoral pathology and of crasiology. We must, nevertheless, entertain the question whether, according to the statements of many authors, changes in the nails can ensue

in consequence of certain definite or ill-defined morbid conditions of the general system, in such a way that they appear curved, ridged, firm, or crumbling—briefly, exhibit changes corresponding to the lower grades of hypertrophy of the nails. Thus, it has been and still is asserted that, in consequence of the syphilitic blood-dyscrasia, the nails become altered in the manner described, and even that the nails exhibit morbid changes in syphilis, in a manner characteristic (pathognomonic) of this disease. The same is said of typhus (Vogel*), fevers in general, acute rheumatism of the joints, measles, pneumonia, puerperium, gastric ailments, and even agitation of mind (Reil,† Beau,‡ and others).

We have already pointed out the special connexion between the change of the nails in question and syphilis. We consider that the alteration of the nails in syphilis is the direct consequence of the disease of the bed of the nail caused by syphilis, just as we must regard the epidermic thickening (*Schwielenbildungen*) on the palm of the hand of a syphilitic patient (psoriasis palmaris "cornea") as the product of the specific infiltration of the papillary layer of the affected portion of skin. Occasionally, the generally sharply defined infiltration of the skin is recognised quite distinctly on the fold of the nail, in the form of a brownish-red border. In this case, the cause of the disease of the nail is evident, and is essentially the same, as, for instance, for the epidermic thickening over an infiltration in the palm of the hand (psoriasis palmaris). Another time, the syphilitic infiltration of the papillæ of the bed of the nail may be so inconsiderable that it cannot be recognised in the skin at the circumference of the nail. It is, however, the better plan to follow the principles which guide us in judging of analogous conditions in other parts of the skin. Accordingly, whenever disease of the nails occurs in syphilis, we look upon it as the direct consequence of disease of the matrix, and of the bed of the nail; and only as an indirect result of the syphilitic dyscrasia. We cannot attach any more importance to the shape,

* Prof. Alfred Vogel, 'die Nägel nach fieberhaften Krankheiten, Deutsches Archiv f. klin. Med.,' vii. Bd., p. 333.

† 'Memorabilium Clinicorum fascicul.,' 3, p. 206. Halæ, 1792.

‡ 'Archives générales de médecine,' 4 Ser., T. xi. Août, 1846, p. 447.

steepness, direction, &c., of the ridges on the nail as in any way characteristic of syphilis.

It therefore still remains to be decided how far the disease of the nails in question can become developed as the expression of any general ailment or of a dyscrasia. We distinctly recollect cases in which, both to the patient and to the physician, the disease of the nails appeared an idiopathic affection. Yet, on closer examination we found a local disease, for instance, eczema scroti et perinæi, explanatory of the process. Here was obtained the natural explanation of the disease of the nails. The same disposition which caused the skin of the scrotum to become affected, had also set up a similar change in the part where the nails were formed.

Thus, in the greater part of the cases a palpable local cause for the affection of the nails can be discovered. Nevertheless, there is a series of cases in which a more general cause seems to lie at the foundation of the disease of the nail. Febrile conditions, constitutional cachexiæ, &c., cause such manifold disturbances in the nutritive processes of the skin, that the nails, as products of the latter, may well be also affected. We need only call attention to the so-called pityriasis tabescentium (*Autorum*). If the epidermis of the whole surface of the skin undergoes alteration in consequence of febrile conditions and constitutional cachexiæ, it is easily understood that the nails—also epidermic productions—should not remain unaffected in their formation, under such circumstances. However, even in these cases, though we admit the constitutional affection as a remote cause, still we undoubtedly regard an alteration of the matrix of the nail as the proximate cause of the abnormal formation.

Development, Course, Prognosis.—In reference to the development of the hypertrophy of the nails, exact observations can only be made with difficulty, for it is only after the lapse of long intervals of time, that appreciable differences in the physiological growth and wearing away of the nails can be recognised.*

* Beau (loc. cit.) establishes a rule for the growth of the nails, which applies equally to all the finger-nails. According to him, a finger-nail grows at the rate of about 1mm. (.04") in a week. The toe-nails also grow at a definite rate, but four times as slowly as the finger-nails, consequently about 1mm. (.04") in four weeks. Therefore the thumb-nail, which, in the adult, including the part hidden by the root, measures about 20mm. (.8"),

Under all conditions, the changes of the nails described, develop very slowly and persist for a very long time, as is already evident from their etiology. The place from which the change of the nail originates is usually the lunula, and consequently the matrix. Not infrequently, however, the earliest traces of the change are apparent at the lateral borders of the nail, or even at its anterior border. The further spreading of the mischief does not follow the direction in which the nail is pushed forward according to the law of its growth, but depends upon the course which the disease of the bed of the nail and of the matrix takes. No rule can be stated as regards the latter important cause. As a rule, we cannot attach any great importance, *subjectively*, to the alterations of the nails, which we have described as hypertrophy of them. All of them exist usually for a very long time, mostly many months and years, but are nevertheless, in great part, also transitory, according as the pathological processes affecting the bed and the matrix of the nail, and occasioning the hypertrophy of the nail, are capable of improvement or of cure. The part of the nail which has once been pathologically altered never, indeed, returns to its normal condition, because no exchange of material occurs in it. But the formation, *in toto*, can become normal, as a normally formed nail is pushed forward by the matrix, and, in its advance, pushes off the anterior diseased portion. Between the two, there is generally a sharp line of demarcation. Diseased and healthy segments of the nail, or zones often alternate with one another in the course of growth, extending over months, according as the disease of the matrix (from eczema, psoriasis, syphilis, &c.) alternately disappears, or again increases. But, nails hypertrophied in a high degree (onychogryphosis) can scarcely ever, in the course of their existence, be replaced by normal nails while the disease (of the matrix) persists. It may easily will require twenty weeks, or almost five months, for its full development. The great toe-nail, on the other hand, averaging 24mm. (an inch) in length, including the root, will require ninety-six weeks, or almost two years, for its growth. By the assiduous and very careful investigations of Berthold (J. Müller's Archiv, 1850, p. 156) it has been determined that the same nail, which, in winter, required 152 days for its regeneration, in summer only required 116 days (!), and, further, that the nails of the right hand are replaced about a week quicker than those of the left! According to Alfred Vogel the great toe-nail can grow again within a year (loc. cit., p. 335).

happen that a nail-horn may, for example, be shed in consequence of its being mechanically torn off, or of suppuration affecting the bed of the nail. But the horn again becomes regenerated if the hypertrophied papillæ of the matrix previously described exist (see Anatomy).

Subjectively, the hypertrophy of the nails is a source of deformity or annoyance to the patients affected. A hand on which there are such altered nails as we have described, always has a very unpleasant look. Moreover, this condition is a further source of annoyance, as the diseased nails become brittle at their free extremities, are torn, and therefore are a hindrance in fine work; or, if the rents are continued into the bed of the nail, they occasion pain. The delicacy of the sense of touch also becomes considerably diminished on the tips of the fingers, because the nails, split up into laminæ in front, or lifted up over a considerable extent, no longer afford the necessary points of resistance for the normal sense of touch. The inconveniences caused by such changes in the toe-nails are of a similar kind. Large, humpy, tap-shaped, and horn-like, curved nails prevent the feet being properly shod, and render walking difficult or painful. Raised, turned-up nails leave the ends of the toes without protection against the pressure of the boot. The toes, therefore, easily become painful, and inflame, &c. It must, further, be particularly mentioned that the lateral border of nails which are increased in their superficial extent, whether they are straight or curved downwards, presses on the lateral fold of the nail, and may set up inflammation and suppuration in it (*Paronychia lateralis**). Red, spongy granulations which bleed easily, and are extremely painful when touched, occasionally project from the inflamed fold of the nail. Walking then becomes great torture. By appropriate treatment, however, the condition can be wholly removed.

Treatment.—It cannot be expected that any treatment of hypertrophied nails will restore the diseased nail-substance to

* We cannot, perhaps, attribute all cases of paronychia to this cause, for we know, on the contrary, very well, that, in many cases, the inflammation of the fold of the nail—arising from any cause whatever—is the primary process, and that, then, the nail of normal size becomes *relatively* too large. As the swollen nail-fold presses against the margin of the nail, the well known severe pain is produced, especially on walking.

its normal condition again. Such a conversion of the horny material is physiologically impossible. We can only speak of treatment, improvement, and cure of the condition in question so far as the remedies and the methods of procedure employed dispose the maternal soil of the nail, the matrix, and the nail-bed, to the production of nail substance of normal condition and shape; that is, that the diseased nail be replaced by a new and healthy one. To the same extent as a healthy nail-plate is pushed forwards from the matrix, and is provided with a normally lamellated substratum (of normal thickness) from the nail-bed, the diseased part of the nail, mostly sharply defined behind, is pushed forwards till it is shed, or is mechanically removed. According to the foregoing account, therefore, which accurately represents the conditions present, the treatment of the hypertrophied nails, or of the nail hypertrophy, cannot be directed against the latter itself, but only against the proximate (the local, mechanical, and organic) and the more remote causes of the abnormal formation of the nail structure.

The remedies and the methods of procedure employed fall under two heads—(a) *Local*; (b) *General*.

a. *Local Treatment.*

We use local treatment with a twofold object. In the *first* place, for the purpose of removing the deformity which a badly formed nail produces, and, in short, to remove the disturbance of function which such a nail causes by pressure, by giving rise to pain in its neighbourhood, by inflammation, suppuration, or formation of granulations in the fold of the nail (Paronychia). *Secondly*, for the purpose of removing the morbid affections of the matrix, and of the bed of the nail, which must be regarded as the proximate cause of the deformity of the nail.

First. We can remove the hypertrophied nails. Only those nails which are considerably increased in circumference require total or partial removal. Consequently, those nails, especially, which are prolonged and thickened upwards and forwards, in the form of claws or horns, or such as are increased in breadth and press against the fold of the nail. The nail-horns and claws are removed by means of scissors, the knife, bone-nippers, or a fine saw, &c. It must be noted that we do not allude to the

complete cutting or tearing away of the nail from its bed, but that we content ourselves with removing the outgrowth projecting beyond the normal level (the horn, the cone). It must not be overlooked, however, that this procedure is liable to several unpleasant complications. For example, the tap-shaped process of the nail may be so hard that we can only remove it with a saw or bone-nippers. By such manipulation the traction may be so violent that the whole body of the nail is torn out of its bed. This obviously may cause the patient very much pain, considerable bleeding, or subsequent suppuration, and render walking impossible for a long time. Another time the nail-horn may be so brittle, that it can only be removed in fragments or mere crumbs. We must not, therefore, promise the patients beforehand to rid them of the *corpus delicti* as a whole. Still more important is the circumstance which we have already duly noted (see Anatomy), that the hypertrophied papillæ, with their enlarged blood-vessels, penetrate for some considerable distance into the tap-shaped processes of the nails. Accordingly, in the removal of many nail-horns, by means of a saw, for example, even 2 to 3 lines beyond the level of their attachment, after breaking through the external horny substance we encounter the tuft of papillæ, which represents a kind of internal, conical "marrow" (Mark-zapfen) of the horn, and by wounding it we occasion very severe pain, and often considerable hæmorrhage.

The operator must be prepared for this circumstance, and the patient should be made acquainted with it beforehand. This papillary tuft is best dealt with by a snip of the scissors, and by cauterising the bleeding stump of papillæ, by means of nitrate of silver, or of perchloride of iron. The vessels by this means shrivel up, and the regeneration of the monstrous nail-horn is prevented. Nails which are enlarged in their superficial extent, but not in thickness, must be assiduously pared. We remove the front border, which is curved downwards or turned up, with the scissors, and also the lateral borders which press against the fold of the nail. We introduce the blunt end of a pair of scissors, from before backwards, under the margin of the nail, and cut it as far backwards as possible into the posterior fold. The portion cut off is lifted out of its fold with a pair of forceps.

The complication of a broad nail which is known as *Paronychia lateralis* (see p. 96), and which consists of painful inflammation, suppuration, and granulation of a lateral fold of the nail, an affection which, as is well-known, occurs mostly on the toes, and especially on the great toe, admits of very successful treatment. It is well known that surgery prescribes for these cases a very painful and bloody operation, requiring for its employment the narcosis of the patient (excision of the lateral portion of the nail by means of the knife). We have employed a method of treatment, which is recognised in other quarters as painless, in so many cases of this affection, and so successfully, that we may be allowed to explain it here, in order that it may become better known. We cut dossils of charpie (having parallel threads) of the length of the lateral fold of the nail, or rather longer. This bundle of threads is laid on the nail, parallel with the fold of the nail. By means of a flat probe, these are now pushed down, thread by thread, between the swollen, inflamed fold of the nail and the border of the nail. By this means, the two are separated from one another, for a dossil of charpie lies between the border of the nail and the inflamed skin. The very painful pressure of the former on the latter is thereby removed. We further pad round about the furrow of the nail with charpie, and then long strips of sticking plaster, one line and a half in width, are wound around the toe, always, however, from above downwards, as regards the inflamed fold, so that this is still further removed from the border of the nail. When provided with such a dressing, whose application, if sufficient care be taken, is not at all painful, the patient can at once put on his ordinary boots, and walk about without pain. After twenty-four hours, the strips of plaster are carefully removed, the threads of charpie which were tucked in are soaked in a lukewarm foot-bath and taken away. Even after this short lapse of time—only one day—we observe that the swelling of the fold of the nail has become considerably diminished, and the latter itself less painful, and that already an open space has been formed between it and the border of the nail. The dressing is then renewed, on the same plan as on the previous day. The tucking-in of the charpie is less troublesome and painful, as the furrow of the fold of the nail has already become more capacious. By continuance of such treatment, the inflammation, swelling,

suppuration, &c., can be wholly subdued within from two to four weeks. Easily bleeding, exuberant granulations must often be first cut off and cauterised, after which they also undergo involution and skin over.

This treatment is equally efficacious whether the paronychia originate in consequence of a primary inflammation of the fold of the nail which causes the nail to be comparatively too broad, or secondarily, in consequence of a primary hypertrophy of the nail. In the latter case, it is necessary to slit up the lateral margin of the nail from before backwards. This can be done with scarcely any pain, if the fold of the nail has been separated far enough from the border of the nail by the procedure just described. Finally, it remains to be noted that in order to prevent the splitting and breaking of brittle nails, and the continuation of such rents into the soft parts, the nails can be covered with wax or simple plasters (for protection).

Secondly. The local affections of the matrix and of the bed of the nail, which must be regarded as the proximate causes of the changes of the nails which have been described, belong either to syphilis or to the affections of the skin before mentioned as non-syphilitic (*Eczema chronicum*, *Lichen exsudativus ruber* (Hebra), *Psoriasis*, &c.). The syphilitic diseases, according to their form and severity, belong to the series of the superficial papular infiltrations of the cutis. (The gummatous forms of the infiltration and the ulcerations produced by their breaking down cause shedding of the nails, but not hypertrophy of them.) Just as such infiltrations on other parts of the body, for example, on the palm of the hand and on the sole of the foot (*Psoriasis syphilitica palmaris et plantaris*), can become re-absorbed, with surprising certainty and in a very short time, by the application of *Emplastrum mercuriale*, combined with constitutional antisiphilitic treatment, or even without such, so, also, it is the case with the analogous affections of the matrix and of the bed of the nail. And, just as the horn-like epidermis, accumulated in excessive quantity over the syphilitic infiltration (*Psoriasis syphilitica cornea*), disappears under the influence of the same application and gradually, in its stead, a normal layer of epidermis is produced, so, also, the nails are again formed normally, if, in consequence of the application of the grey plaster, the bed of the nail and the matrix are freed

from their syphilitic infiltration. The mercurial plaster must not, however, be simply laid on the nail. It must be wound, in the form of a long strip, round about the ungual segment of the finger or toe, so that it compresses the fold of the nail. It then acts through the skin of the fold of the nail, specifically, and, by the continuous pressure, as an absorbent, on the infiltration of the matrix and of the bed of the nail, and subsequently effects an improvement in the growth of the nail.

In the treatment of the non-syphilitic affections of the bed of the nail which interfere with the normal formation of the nail, more particularly, eczema chronicum, psoriasis, ichthyosis, &c., all those applications are of service which are employed with advantage in the treatment of the same diseases on other parts of the skin. Such, therefore, as *sapo viridis*, *spiritus saponatus kalinus* (Hebra), *unguentum diachyli* (Hebra), cauterisation with concentrated solution of potash (1 to 2), tar, &c., the special use of which is fully detailed in the chapters on Eczema, Psoriasis, Ichthyosis, &c., in the second and third volumes of this work.* It is obvious that the influence of all these local remedies must be directed, not to the nail itself, but to the substratum producing it, the matrix and bed of the nail. We will here only call special attention to one remedy—caoutchouc. Hebra (Heft. 1, 'Archiv f. Dermatol. und Syphilis,' 1869) has called attention to the advantage derived from the employment of caoutchouc in the treatment of various chronic diseases of the skin. This is applied in the form of coverings worn as articles of dress and fitting the diseased parts, and either as vulcanised (black) caoutchouc, or as caoutchouc (indian-rubber) cloth (provided with a layer of caoutchouc). The action of the caoutchouc coverings consists, first of all, in an extreme maceration of the epidermis by the perspiration from the skin collecting under the caoutchouc. In this way, epidermic shields, several lines in thickness, such as are met with in ichthyosis, lichen ruber, &c., on the palm of the hand, the sole of the foot, and on the heel, can be softened and removed within twenty-four hours. The caoutchouc appears also, however, to diminish the chronic hyperæmia and swelling of the papillary layer, either by its own peculiar action, or by virtue of its containing finely divided sulphur. And, as this chronic, hyperæmic swelling of

* See pp. 35 and 153, vol. ii., and p. 67, vol. iii.

the papillary layer is the proximate cause of an increased production of epidermis, a normal formation of the epidermis ensues on the disappearance of this condition. It is in this twofold sense, therefore, as a means for producing maceration and for diminishing the swelling of the papillary layer, that caoutchouc acts in cases of hypertrophy of the nails caused by chronic eczema, ichthyosis, &c. If, in addition to the hypertrophy of the nails, the palm of the hand is also the seat of an hypertrophic formation of epidermis, we then let the patients wear caoutchouc gloves. If the nails, only, are diseased, *i.e.* the fingers only, or the papillæ of the bed of the nail, caoutchouc finger-stalls are sufficient.

The caoutchouc envelopes are taken off at the end of twelve hours and cleansed with water. After the parts of skin which have been covered have been thoroughly washed with soap or spir. saponatus kalinus, or, according to the indications present, cauterised with solution of potash, the caoutchouc envelopes are again put on. In order to fulfil the same purpose with regard to the toes, caoutchouc sandals, socks, or stockings must be prepared.

b. Constitutional Treatment (internal remedies).

All internal medicaments which appear to possess a curative influence on the disease of the bed of the nail and of the matrix, which produces the hypertrophy of the nails, also, indirectly, have a similar influence on the hypertrophy of the nail itself. The same may be said as regards constitutional antisymphilitic treatment. We may, however, particularly mention certain of those remedies whose internal use is generally followed by a good result in the chronic affections of the skin, connected with the formation of the nails, which have been often mentioned, eczema, lichen ruber, psoriasis, &c. We allude to arsenic, iron, and the combination of the two, arseniate of iron. In the chapters* on those affections it is explained, more at length, that these remedies partly diminish the disease itself, for example, psoriasis or lichen ruber, and, partly, effect an alteration in the stratum of the skin which produces the epidermis and disposes this to discharge its function normally. The formation of the

* See pp. 26, 68, and 143, vol. ii.

nails, as belonging to the function of the matrix and of the bed of the nail of producing epidermis, can become normal in the same way, under the influence, direct or indirect, of the internal use of the above-named remedies. Arsenic is given in the form of Fowler's solution or of the Asiatic pills, in increasing doses—after the plan very fully described by Hebra (*loc. cit.*). In chlorotic individuals, who are particularly liable to become affected with chronic eczema,* and, therefore, also, either subsequently or at the same time, suffer from the lower degrees of the disease of the nails described, iron, or the combination of it with arsenic, is to be recommended in such affections. This combination was first prepared by Wilson and was modified by Hebra, to facilitate its easier administration according to the following formula: *R. Liq. Arsen. (Fowleri)* two drachms, *Tinct. Malatis Ferri*, 2 ounces, *Aquæ Menthæ*, 4 ounces; one tablespoonful to be taken morning and evening. Arsenic and its combination with iron must be taken uninterruptedly for a very long time, for six or nine months, if the change in the formation of the nails hoped for is to be attained. It is obvious that, in certain cases, a combined treatment, consisting of internal remedies and appropriate local applications, will be suitable and will contribute to a more rapid success.

Under all circumstances, however, having regard to the great tardiness of the physiological reproduction of the nails as shown previously, a long period of time must be expected to be taken up in the cure of the hypertrophy of the nails.

* See 'Etiology of Eczema,' p. 133, vol. ii.

CHAPTER XXXVII.

CLASS VI.—DIV. III.—HYPERTROPHY OF THE CONNECTIVE TISSUE; A. DIFFUSE HYPERTROPHY OF THE CONNECTIVE TISSUE.

1. (a) SCLERODERMA ADULTORUM.

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Hautsclerem, Sclerema, Scleroma adutorum; Chorionitis, Sclerostenosis cutanea, Forget; Cutis tensa chronica, Fuchs; "Keloid of Addison;" Elephantiasis sclerosa, Rasmussen; Cicatrisedes Hautsclerem, Wernicke; Sclerosis dermatos, Sclerosis corii, *Scl. telæ cellularis et adiposæ*, Wilson.

History.—The name *Sclerema adutorum* was introduced into the nomenclature of skin diseases by Thirial, in the year 1845. Thirial published, in the '*Gaz. Méd. de Paris*,' 1845, p. 523, under the title "*Du Sclérème chez les adultes*," the narratives of the cases of two young women, one 21, the other 15½ years of age, who were in the *Hôtel Dieu* under the care of Trousseau. The skin of these patients, over considerable tracts of the body, was indurated and felt "like a frozen corpse, without, in reality, being cold." In one girl, the face was affected, the skin being rigid and colourless, so that her features appeared as immovable as those of a wax figure. In the second case, similar appearances were observed and the tongue also appeared hard and rigid. Since this publication by Thirial, the communications referring to the subject have so considerably increased; so many physicians and authors have published cases, under the same or similar titles, in which essentially the same symptoms had been observed on the skin as those which Thirial had pointed out in the two girls mentioned; that, at the present time, more than fifty cases of *sclerema adutorum* have been recorded.

According to the first historical account published by Arning,* Curzio described the first case of such a peculiar induration of the skin, in the year 1752, under the title 'Dissertation anatomique et pratique sur une maladie de la peau d'une espèce fort rare et fort singulière,' and Henke† the second case, in the year 1809. "The skin was as hard as wood and slightly colder than that of the rest of the body, the colour of the skin was whitish yellow." Two cases are also cited by Gintrac‡ from the earlier literature. One of them from Diemerbröck (*Anatomes*, lib. viii., cap. 1, p. 502) and the other from Zacutus Lusitanus ('*De Praxi Med. Admir.*', lib. iii., p. 110), both of which are too imperfectly described as regards their symptoms to allow us to number them with the others in this place without hesitation.

After the publication of Thirial followed communications from Forget, in Strasbourg,§ 1847, on a case observed by himself and one observed by Grisolle; from Bouchut,|| Putegnac,¶ Brück,** Fantonetti,†† Pelletier,‡‡ Rillier and Barthéz,§§ Eckström,|||| Gillette,¶¶¶ who, in addition to a case observed by himself and one by Natalis Gillot, recapitulated twelve from other authors. Soon followed new cases from Fiedler,*** Oulmont,††† Fuchs,‡‡‡ Robert McDonnell,§§§ and Arning,||||| who,

* 'Beitrag zur Lehre vom Sclerema adultorum,' Wurzb. med. Zeitschrift, 1861, Bd. ii., p. 186.

† 'Handbuch f. Erkenntniss d. Kinderkrankheiten.' Frankf. a. M. 1821, p. 80.

‡ 'Journ. de Médecine de Bordeaux,' 1847.

§ 'Gaz. de Strasbourg,' N. 6, 1847, u. Schmidt's Jahrb., B. 56, p. 184.

|| 'Gaz. Méd.,' Sept. 1847.

¶ 'Journ. de Médecine,' Oct. 1847. Schmidt's Jahrb., B. 62, p. 57.

** 'Hanov. Annal.,' 1847, vii., 5 and 6.

†† 'Annali universi di Milano,' 1847; and 'Gaz. Méd. de Paris,' 1848, recapitulated by Gintrac.

‡‡ Communicated by Forget, 'Journ. de Médecine,' Feb. 1848.

§§ Ibid. ||| 1849, 'Hygiea,' B. ii., p. 45.

¶¶ 'Archives générales de Médecine,' Feb. 1854, Tom. 2, p. 657.

*** 'Deutsche Klinik,' 1855, N. 34.

††† (Doubtful.) 'Revue Méd. Chir. de Paris,' 1855, xvii., p. 321.

‡‡‡ 'Bericht über die med. Klinik zu Göttingen im J. 1853-4,' Göttingen, 1855, p. 192.

§§§ 'Canst. Jahreshb.,' 1855, B. 3, p. 360.

|||| 'Beitrag zur Lehre von Sclerema adultorum,' 'Würzb. med. Zeitsch.,' 1861, Bd. 2, p. 186.

besides an original case, also published a critical examination of seventeen cases of sclerema of the skin, already known in the year 1861, which he collected together. Further communications came from Bazin,* Förster,† Nordt,‡ Mossler,§ Köhler,|| Köbner,¶ the latter collected, in conjunction with one case observed by himself, a total of twenty-nine cases in which sclerema had been satisfactorily diagnosed, including the cases of Bärmann, Brück, Förster, Georg Jäger, Pierguin, Fiedler, Nordt, Bazin, Mosler, and Köhler, which he added to those already enumerated by Arning. This number was soon increased by the publications of Binz,** Wernicke,†† Villemin,‡‡ Gamberini,§§ Auspitz,|||| Plu,¶¶ Rasmussen,*** Paulicki,††† Fagge,‡‡‡ A. B. Arnold,§§§ Barton,||||| Neumann,¶¶¶ Rossbach.**** To these must also be added Hebra's experience. He saw two remarkable cases in his hospital practice and one in private. Lately, two additional cases of sclerema adutorum have been admitted into the department for skin diseases here. Although we have already published them in the Annual Reports,†††† we will nevertheless, as they came under our own observation, introduce

* 'Léçons sur les affect. cutanées artificielles et sur la lèpre,' &c. Paris, 1862.

† 'Wurzb. med. Zeitschr.,' 1861, B. 2, p. 294.

‡ 'Ueber das einfache Sclerom der Haut,' Inaugural-Dissertation. Gies-sen, 1861.

§ 'Virchow's Archiv,' B. 23.

|| 'Würtemb. med. Correspondenzbl.,' 1862, xxxii., 15 et seq.

¶ 'Klinische u. experim. Mittheilungen.' Erlangen, 1864, p. 29 et seq.

** 'Beobachtungen zur inneren Klinik.' Bonn, 1864, p. 177.

†† 'Beitrag zur Lehre vom Hautsclerem.' Inauguralabhandl., v. Jul. Wernicke. Jena, 1864.

‡‡ 'Gazette hebdom.,' 2 sér., 1, 45.

§§ 'Journal de Bruxelles,' Jan. 1864.

|||| 'Wiener med. Wochenschrift,' 1863, 47-50.

¶¶ 'Gaz. d. Hôp.,' N. 77, 1866.

*** 'Scleroderma and its Relation to Eleph. arab.,' by Dr. Wald. Rasmussen, Prosector in Copenhagen, translated by Dr. W. Moore. Edinburgh, 1867.

††† 'Beiträge zur Sclerodermie, Archiv f. Path. An. und Phys.,' 43 B., p. 234, 1868.

‡‡‡ 'On Keloid, Scleriosis, Morphœa, &c.,' by C. Hilton Fagge. 1868 (reprinted from the 'Guy's Hospital Reports').

§§§ 'Three Cases of Scleroderma,' American Journ., N.S., 115, 1869.

||||| 'Dublin Quart. Journ.,' N. 95, August, 1869.

¶¶¶ 'Lehrb. d. Hautkr.,' 1873, Wien, p. 379 et sequ.

**** 'Virch. Arch.,' B. 50.

†††† 'Ärtzl. Ber. des k. k. allg. Krankh.' Wien, v. Jahre, 1867 und 1868.

them by means of these pages to a larger circle of readers among our professional brethren.

CASE 1.—Fogel Farkas, 28 years of age, from Szigeth, Hungary, came to the Clinique in 1867. The skin of the left forearm on its inner surface was moderately swollen, thickened, tightly fixed to the subcutaneous structures, could not be pinched up into folds, was of a rosy red colour, with a whitish gloss, and smooth; the epidermis was normal. The affected part was moderately painful on pressure, and more so spontaneously. The temperature was not elevated. Corresponding to the sulcus bicipitalis internus of the left upper arm, this hard, tense, glossy condition of the skin was continued towards the axilla in the form of a cord, in such a manner that its breadth diminished towards its upper end. On the anterior aspect of the left leg, the skin was similarly affected over a patch 5 or 6 inches in length and 2 or 3 inches in breadth. The induration of the sclerosed parts was not sharply limited from the surrounding parts. The duration of the disease was five years. There was no obvious cause to be assigned, and its development was not accompanied by any remarkable symptoms. The general health was good. The internal organs were normal. During the following weeks of his stay in the Hospital, and whilst we were observing him very carefully, isolated, subcutaneous, ill-defined tubercles like firm dough, and attended with subjective and, at times, moderately severe pains, gradually appeared on the left thigh, on the left leg, on the right forearm, and over the junction of the right fourth rib with the sternum, and the skin over them became sclerosed exactly as on the places previously described. The patient, at our direction, rubbed in half a drachm of grey ointment twenty-seven times. In the urine, the urea was diminished, and mucous crystals of free uric acid, and also kidney epithelium, were found. The patient left the Hospital at the end of ten weeks without any change having occurred in the sclerosed patches of skin, but they were less painful.

CASE 2.—Schira Katharina, 33 years of age, the wife of a cottager, was attacked with the cholera in the year 1866, and had felt weak ever since. The present disease began four months previously with the sensation of a burning in the arms

and pains in the joints. In course of time, stiffness of the skin and of the fingers appeared, whilst nettle-rash showed itself repeatedly on the diseased parts, and rheumatic pains frequently recurred. Sixteen years before, she had had a child born, which died at the age of 9 months. Since then she had not conceived. Menstruation was profuse. In the year 1866 she came under care on account of Lupus erythematosus.

Condition on admission.—On the tip of the nose was a spot of the size of a three-penny piece, superficially scarred in the centre, and bounded at the circumference by a somewhat elevated reddish border, looking as if it had been pricked (*angestochen*). On the edge of the upper lip was a spot with a reddish border, scarred on the surface, and of the size of a pea (Lupus Erythematosus). On taking hold of the hand, it felt cold. The palm of the hand was covered with cold sweat. If we grasped and attempted to raise the arm it seemed as if it were dead or frozen. The fingers were half flexed at the joints; on their extensor surfaces the skin was tightly stretched, as if united to the subjacent bone, could not be pinched up into a fold, and was smooth, somewhat greasy to the touch, marked with dark yellowish-brown pigment spots and streaks and dots, between which there were intervals of a white colour without pigment. The skin of the extensor and flexor surfaces of the wrist, of the forearm, of the bend of the elbow, and of nearly the whole of the upper arm as high as the shoulder, was in a similar condition, stiff, hard, not easily pinched up into a fold, and only in company with the whole subcutaneous tissue, like as if it were one with the subcutaneous tissue, and, in short, united to the fascia. At the wrist, the extremity could not be moved either actively or passively. At the elbow, it was slightly flexed, and active flexion was complete, the power of extension was less perfect. The induration of the skin appeared to extend along the sulcus bicipitalis internus, close to the armpit, in the form of a riband-like strip; outwards, in the neighbourhood of the attachment of the deltoid, the induration felt just as cord-like, with a sort of limitation inwards, so that from thence towards the sulcus bicipitalis internus, and also towards the shoulder, the skin was less thickened and more supple, and was more uniformly and normally pigmented. The subjective sensibility of the parts affected was normal. Pressure caused

no pain. Both arms, the front and back of the neck, as low as the second rib in front, and behind down to the space between the shoulder-blades, upwards, passing almost to the hairy scalp, were dotted over throughout with brown spots, spaces intervening without pigment. The skin was firm, smooth, thick, and could scarcely be pinched up. In front, even as far as beneath the mammæ, the skin felt thick, hard, and only slightly supple, but was, however, normally pigmented. The skin of both legs, from the middle down to the ankle, was white but firm, and with difficulty pinched up in a fold. Under it there was œdema, and the bone was considerably thickened and hard. The skin of the face was dotted with brown (as in chloasma), and showed a few white spots, was but slightly firmer than natural, and tolerably freely movable. The mucous membrane of the mouth was dry, traversed by vessels, and the fauces slightly reddened. The patient went home at the end of two days (to Lower Austria). We had, however, previously excised a piece of the sclerosed skin for microscopic examination, the result of which will be given later.

We cannot conclude our notice of the special literature of scleroderma without calling attention to the writings of Addison, which have been published in the 36th volume of the New Sydenham Society's publications, London, 1869, under the title of 'A Collection of the Published Writings of the late Thomas Addison,' edited by Dr. Wilks and Dr. Daldy. In this is a paper which was read by Addison in the year 1854 before the Royal Medical and Chirurgical Society, 'On the Keloid of Alibert and on the true Keloid.' Under this name, Addison has described four cases which, according to their symptoms, must be regarded as identical with scleroderma.

Fagge (in the paper above quoted) also declares himself to be in favour of the identity of the keloid of Addison with the scleroderma of the German and French authors, and to Addison's four cases adds a series of three other cases of scleroderma, which had subsequently come under care in Guy's Hospital. As, however, Er. Wilson is of a different opinion in regard to the interpretation of the keloid of Addison ('Journal of Cutaneous Medicine,' 1868, vol. ii., N. 7, p. 278), we will refer to the chief characteristic features of Addison's cases, which

agree so thoroughly with the symptoms of the scleroderma of other authors, that any other interpretation seems scarcely admissible.*

In the handbooks on skin diseases which have appeared since scleroderma has become well recognised, this disease has either not been noticed at all, or, for the most part, has only been viewed in the same light as in the monographs above quoted. We must, therefore, consider the authors of the latter, on the whole, as the real source of the literature of this form of disease. It will only be in relation to special points that we shall have to make particular mention of one or the other author.

Definition and Symptomatology.—By the term Scleroderma adultorum, we understand an idiopathic, morbid change in the skin which is chiefly known by a diffuse and remarkable induration, rigidity, and comparative shortening† of the affected part.

The morbid change appears on various parts of the body, mostly on the upper extremities, less frequently on the lower ones; and is either confined to one continuous patch or to isolated streaks and spots of the general surface, between which the rest of the skin is in quite a normal condition.

Now and then, we find that the symptoms of the scleroderma

* Thus it is said of the first of Addison's cases (a young woman 20 years of age), "The integument had a hard, drawn, tight look on the limb being extended; there might be felt through nearly the whole length of both arm and leg a rigid band which gave to the touch the impression of some inelastic substance tightly strained under the integument. . . . Three months later the pain in the arm and leg had much increased with a feeling of *shortening*, and after sitting for some time it was with difficulty the foot could now be extended. The band down the arm had become more distinctly expressed, had assumed a slightly tendinous and glistening character, and had thrown out several lateral processes."

And of the third case Addison says:—" . . . The skin thickened and apparently adhering to the bone, with considerable loss of power and motion, and contraction of the arm."

On comparing the very marked symptoms here given with those of the two cases above described, their agreement cannot remain doubtful for a moment. We hold this opinion in opposition to Wernicke, who does not appear to be thoroughly acquainted with keloid (Alibert).

† Skin affected with scleroderma is of the same length as before, but, owing to the loss of its elasticity, is relatively too short for the parts beneath.

appear variously characterised on different parts of the body of the same individual; whilst, in others, the whole skin appears uniformly thickened. In these cases, the skin is swollen over a greater or lesser extent, is moderately elevated above the level of the surrounding skin, is smooth and shining or slightly scaly, of a brownish-red or pale white colour, like wax or alabaster, or is pigmented in patches of a brown colour with patches interspersed without pigment. If the finger is drawn over the diseased skin no permanent depression remains. It feels firm, like a board, rigid and cold, as if it belonged to a frozen corpse. It is difficult or impossible to pinch up a fold of skin, and the latter is not movable on the subjacent tissue. It appears as if it were of one consistence with the subcutaneous tissue, and closely soldered to the muscular fascia (as, for example, on the forearm), or firmly joined to the bone (over the joints). The skin appears, therefore, as if it were shortened, put on the stretch, like a tendinous band, passing over the flexor surface of a joint which, consequently, cannot be extended. The arm and each of the fingers, for this reason, appear in a state of semiflexion, and their position cannot be altered, either actively or passively, in the least, or at any rate only very slightly. If the skin of the face be affected the features are rigid, quite immovable, as if "petrified," like those of a marble bust. Neither pain nor joy causes the "stony" countenance to alter. The skin is changed in the manner described, incapable of wrinkling, contracted. The mouth, for this reason, opens imperfectly, and the *alæ nasi* are tightly stretched.

Now and then, such a scleromatous patch of skin, resembling a firm, roasted sward of bacon, extends for some distance in the form of a ribbon-like strip, depressed somewhat below the level of the normal surrounding skin. An appearance is produced as if there were a tight band, sunk in the cutis, pulling the whole skin down. If such a scleromatous strip, for example, passes across the mamma, the latter appears as if cut into two parts, or the free edge of a scleromatous strip is elevated like a ridge.

In other parts of the body, and evidently corresponding to a later stage of the disease, the skin likewise appears hard and cannot be pinched up into a fold, but, at the same time, it is exceedingly thin, parchment-like, resembling a thin glossy scar,

without a soft base, as if there were no subcutaneous tissue, no fatty layer, nor any muscles under it, and it gives anyone the impression that the thinned skin is directly connected to the bone, like the leather binding of a book to the board beneath.

Of the *unvarying characters* of scleroderma, the chief are, therefore, the striped, ribbon-like rigidity, in patches or spread over a larger extent of skin, the thick consistence, the inability to be pinched up into folds, and the shortening of the skin.

As *variable* symptoms, may be mentioned, uniform but slight swelling or depression beneath the level of the normal surrounding skin; the colour and the pigmentation.

The hardened tracts of skin are either of a pale rosy-red, or brownish-red, or uniform dingy white colour, like œdematous skin; or they appear much less uniformly pigmented of a dark brown tint; or, finally, remarkably speckled, because irregularly pigmented spots, resembling freckles, and also larger ones exceeding the size of half-a-crown are present, and spots intervene which are wholly without pigment.

The epidermis of the diseased patches of skin is either smooth and of normal thickness and condition, or it is somewhat wrinkled, and peels off here and there in thin flakes and strips like fine gold-beaters' skin.

The temperature of the sclerosed patches, tested by the touch, is guessed to be lower than that of the normal portions of skin. Trial with the thermometer proves also, mostly, the temperature to be about 1 or $1\frac{1}{2}^{\circ}$ (C.), 1.8° or 2.7° (F.) lower than that of the healthy skin. Observations on this point, however, are not to be taken unreservedly, because the application of the instrument to the usually exposed sclerosed parts can only be imperfectly accomplished.

The diseased skin shows a quite *normal sensibility* to the touch, to the influence of heat and cold, and to Weber's æsthesiometer. The sensibility appears somewhat diminished in isolated cases only. In a few cases pain is complained of spontaneously, but it is only temporary. Moreover, the patients complain rather of pains in the more deeply situated parts, in the bones and joints, than in the sclerosed patches. On the other hand, pressure made externally, as, for instance, by anyone making the examination, will occasionally elicit an expression of pain.

The secreting function is undoubtedly usually diminished. Most frequently, the diseased skin feels dry. We have, however, seen the scleromatous skin covered with a "cold sweat," and the same has been observed by others. So, also, the sebaceous secretion is not invariably absent. Sometimes the skin feels greasy and glistens as if it had been oiled. Köbner has even seen acne, and, consequently, inflammation of the sebaceous glands, on a scleromatous patch.

The scleroderma does not in any way alter the vital peculiarities of the affected skin, so that this should not participate in other morbid processes which attack it. The scleromatous skin is, on the contrary, as liable to undergo alteration, in the form of inflammation or ulceration, for instance, from the direct influence of irritation (vesicants), acting on it, as the normal skin. Indeed, such a patch will be readily subject to inflammation and ulceration from comparatively slight injuries; such, for example, as pressure and excoriation. It also shares in morbid processes which attack its vicinity, and so spread on to it—for example, erysipelas; or an exanthem which, as an expression of a general disease of the system, attacks the whole integument. Thus, for instance, herpes zoster and variola have been seen on scleromatous skin.*

The mucous membrane of the tongue, of the gums, of the soft palate, and of the pharynx, also, showed in certain cases (Arning, Sedgwick, Fagge) distinctly hard, ribbon-like, retracted strips. In Fagge's case, one half of the tongue was smaller than the other. The sense of taste was not diminished on the diseased patches. Arning examined one scleromatous pharyngeal patch from his case and found many elastic fibres.

The system generally does not appear to be manifestly influenced by the local morbid processes of scleroderma. The patients are not of blooming appearance, it is true, nor, on the other hand, are they cachectic, but enjoy, for the most part, a moderately good state of health. The morbid changes in certain organs, as, for instance, the lungs (tuberculosis), the heart (valvular defects), and so forth, which have been observed in this or that case of scleroderma, and, in particular cases, have even caused death, cannot be considered to have a close connexion with the skin affection described, as such conditions

* Bazin, loc. cit., p. 363; and Arning, loc. cit.

were only present in a few cases, and, in these, had either existed for a long time previous to the appearance of the scleroderma, or were not developed until the skin affection had been of long duration.

Course and Termination.—We have failed to find any statements elsewhere as to the appearances which indicate the commencement of the change of the skin which is peculiar to scleroderma. All the observers mentioned have, in their respective cases, met with the disease when it had already become characteristically marked as described above, and had no information to record concerning its early development. We ourselves have made the following observation in the case of V. F. (see case 1, p. 107). During his residence in the Hospital this patient exhibited slight swelling in patches of skin hitherto quite normal. The skin in such a spot was normally coloured and somewhat elevated. On examination, a doughy, elastic infiltration was felt under it, in the subcutaneous tissue, indicating a circumscribed cedema. After some days, the cutis over this had diminished in consistency and mobility, and, at length, owing to partial diminution of the swelling, the cutis was stretched out flat, rigid, and immovably soldered to the subjacent structures; in short, was stamped with the characteristics of scleroderma.

When once developed, the changes in the diseased skin proceed so slowly that they are scarcely noticed after several months' observation, or even after a longer time. As, on account of the good state of their general condition and the inefficiency of any treatment, very few patients affected with scleroderma remain, for long, under the observation of the same physician, it is but seldom that we have the opportunity of determining the nature of such changes in scleromatous patches of skin. Certain patients, however, have been again seen after the lapse of months or years.

It has now become certain that scleroderma progresses in a twofold manner. At one time there results a complete resolution of the scleroderma. The sclerosed patch of skin becomes gradually softer, more elastic, movable; it regains its normal colour and suppleness, and the affection disappears completely without any trace of its previous existence remaining. At another time, the elevated patches of scleroderma previously

described, undergo atrophy. The skin, which at the commencement is somewhat raised above the normal level, rigid and board-like, and, at the same time, appears thickened, because it feels united to the subcutaneous cellular tissue, becomes gradually thin and parchment-like, because the subcutaneous cellular tissue, the fatty layer, and probably also the muscles, become atrophied to a considerable extent. The thin and, it may be, shrivelled, contracted cutis now appears to lie directly on the bones and to be firmly soldered to these. At the same time, its upper surface is of a glossy, red aspect, its epidermis is soft and wrinkled, its pigmentation for the most part irregular, as above described, dotted with brown, with intervening white spots. Wernicke considered this condition to be a special form of scleroderma, and gave it the name of "cicatrising sclerema of the skin." Er. Wilson, who only appears to have recognised this affection as a substantive form of disease, from Fagge's last publication, may have had the last mentioned condition in view in his chapter on 'Atrophia cutis,'* whilst he sketches, in a few words, in another place,† the first stage of the disease (described by us, higher up), under the name of *Sclerosis telæ cellularis et adiposæ*, or *sclerosis dermatos*.

Hebra is of opinion that many symptoms during the course of the sclerosis certainly point to a difference in separate cases, and justify us in distinguishing those cases in which there is a resemblance of the diseased skin to parts of a frozen corpse, from those in which the skin appears tightly stretched, thinned, and pigmented; and this is so much the more desirable because the former have usually an acute, and the latter a chronic course. The infrequency of this disease, however, prevents his coming to a conclusion, as yet, as to whether we have to deal with one disease in several forms, or with different maladies.

We are of opinion that it neither represents the actual state of the matter, nor is advantageous to the clear perception and understanding of these remarkable conditions, to separate different symptoms from one another, as special kinds of scleroderma, in the way that Wernicke and Wilson, especially, have done.

* 'On Diseases of the Skin,' Sixth Edit., p. 393.

† Loc. cit., p. 389.

The symptoms of the development of the characteristic features of the scleroderma, as well as of its involution, follow one another in the manner described by us, and represent therefore a substantive form of disease. This fact is certainly not so clearly evident from the comparative consideration of various cases of disease remote from one another in point of time, as when circumstances permit of the various symptoms described being observed at the same time in the same patient, as has happened to ourselves. On the face, for instance, the skin is rigid, thick, immovable. On the arm of the same patient, the skin is thin and parchment-like, the whole arm is wasted, as if consisting only of bone and skin, and the latter is tightly stretched. On the trunk, on the contrary, where, months previously, the skin was scleromatous in a similar manner to the patch on the face, it has now returned to the normal condition.

A complete involution of the affection is only possible in the elevated sclerosis. The atrophic, or so-called cicatrising form is not capable of any improvement, so that the elevated form represents the acme of the process, from which, on the one hand, the disease may pass into a condition of resolution, or, on the other hand, into one of atrophy and contraction. The disease persists in the latter condition for years, and the patients experience only local relief or recovery, in so far as the first forms undergo involution. Death has been observed hitherto in six cases, but never as a direct result of the skin affection—of the scleroderma.

Diagnosis.—The symptoms of scleroderma as regards its characteristic features appear to be described with such remarkable uniformity by all observers, that in this fact there is already demonstration how very manifest the appearances of the skin affection in question are, and how surely, therefore, they must be regarded as of a special nature. In order to diagnose scleroderma, it is only necessary to make a careful and unprejudiced examination of the patient. Any one who remembers the characteristics of the disease mentioned, and sees an instance of it before him, with the rigid, "stony" lines in the countenance, who touches an arm affected with scleroderma, feeling as if it were frozen, and its skin firmly united to the subjacent structures, incapable of being pinched into a fold, or dimpled with the finger,

wooden, or like alabaster, &c., has, indeed, discerned the disease in a moment. We must therefore refer to the symptoms described above for a good differential diagnosis of scleroderma.

From a theoretical point of view, however, it is well to mention, in connexion with the differential diagnosis, that cases are occasionally met with which show a resemblance to keloid. The consideration of the whole features of the disease will guard against such an error, and so much the more surely if it is borne in mind that keloid always remains confined to smaller patches of skin, exhibits circumscribed, cicatricial, mostly reddish eminences, and is followed by painful sensations. The more exact description which is given of keloid in a subsequent chapter will remove every source of doubt.

Etiology.—The cause of scleroderma is as yet unknown. In individual cases, certain conditions and morbid processes which had either immediately preceded the outbreak of the disease, or had been present for some time previously, have been considered to act as causes. In proportion, however, as the number of cases recorded increased, the probability diminished that any one of the known or suspected influences gives rise to the disease. It was very often found that the disease had not been preceded by any striking symptoms or events, and that symptoms which in one case had preceded the scleroderma by a longer or shorter interval, in other cases were altogether absent, or were replaced by such that had no relation with them.

The precursors mentioned by the majority of authors as most frequent are "chills," rheumatic pains, well-marked joint-rheumatism, and erysipelas. These statements refer only to isolated cases, and are founded almost entirely on the assertions of patients. We ourselves, as well as most authors, cannot therefore attribute an etiological significance to these influences, as regards particular cases, and still less so as regards all cases. The greater number of patients affected with scleroderma, after the most careful inquiry, fail to mention any other disease which preceded the skin affection. The same is true of the so-called predisposition to this particular disease. Neither the general constitution of the body, nor the age and sex afford any indication. It may be said generally that patients affected with scleroderma present an aspect of chlorotic anæmia. Apart from those cases in which, simultaneously with the affection of the

skin, a noticeable organic lesion was present, as, for example, cardiac disease, tubercle in the lungs, Bright's disease, on which, mostly, the chlorotic anæmia depended, a condition of chlorotic anæmia was neither noticed constantly nor in a high degree in patients affected with scleroderma. Evidence in favour of the supposition that chlorotic anæmia was a predisposing influence was thought to be shown by the fact that the skin affection improved most quickly under a tonic and strengthening therapeutic and dietetic treatment. This may indeed be true to a certain extent, for the greater part of such patients have not a very healthy appearance. It may be that the disease, by long continuance, has some influence on the state of the general nutrition. This seems to us the most probable supposition, on account of the view we take of the anatomical changes in scleroderma. In addition must be noted the hitherto unexplained fact which ought, however, to be borne in mind, that in most of the cases of scleroderma which have been recorded, the patients belonged to the lower and working classes, and, thus, the anæmia which has sometimes been shown to exist may rather have depended on the wholly insufficient diet of the patient than on the affection of the skin. Whether this defective state of nutrition may also serve as a cause of the skin affection can only be surmised. In opposition to this explanation there is the circumstance that, in proportion to the thousands and thousands of badly nourished individuals of the working classes, scleroderma has remained such a very infrequent disease.

The time of life seems to have no special influence on the disease. It is seen in early childhood, in children six years of age, as well as in persons advanced in years. Very young infants appear to be exempt, at least in so far as we accept the *sclerema neonatorum* (*Algor progressivus*, *Greisenalter der Kinder*, *Decrépitude infantile*) as a different disease, from the *scleroderma adultorum*. The greater number of persons affected are middle-aged.

Whether the sex is of importance in relation to the point under discussion has not yet been determined. Among the recorded cases of scleroderma only one-fourth occurred in males, and three-fourths in females. With a larger number of cases the proportion in the two sexes might very likely become more equal. At least, there is no reason to be found for a greater

predisposition of the female sex to become affected with scleroderma, since the sexual functions in women—menstruation, pregnancy, the puerperal state, involution of the uterus, palpable pathological changes in the sexual organs, &c.—are not in any way connected with the cutaneous malady in question.

Anatomy, nature of Scleroderma.—In connexion with the question of the nature of the pathological processes, whose expression the scleroma represents, we will consider first the pathologico-anatomical conditions which have been found on examination of the scleromatous skin. After investigating the anatomical conditions, we will consider the clinical symptoms, and, by this means, we may hope to arrive at a better understanding of the latter.

The materials hitherto afforded for the investigation have been furnished by eight cases of scleroderma: In six of these, death had occurred, and the observers (Förster, Köhler, Gintrac, Auspitz, Arning, Rasmussen) have communicated the results of the anatomical investigation of the sclerosed skin as well as those of the general autopsy. The seventh case is the one recorded by us, No. 2, p. 107 (*Schira Katharina*), in which, during life, we cut out a sclerosed piece from the skin of the left upper arm, and whose histological structure we will also describe here.*

In neither of the six recorded fatal cases was the scleroderma considered with any certainty to be the cause of death. The latter appears rather to have been tuberculosis of the lungs (Förster), cardiac disease (Gintrac), or Bright's disease (Auspitz). Arning mentions marasmus as the cause of death, and Rasmussen, only, remarks that scleroderma may lead to marasmus, exhaustion, and death, for he states that, in the case described by him (as in those of Binz and Plu, whose cases were not thoroughly examined), he had seen the disease take a more acute course, and described circumscribed swellings (glands) filled with lymph-cells situated on the pleura and the diaphragm of his patient, as metastases from the seat of the sclerosed skin.†

The results of the anatomical and histological examinations

* Neumann has since published the results of a similar examination (loc. cit., p. 356).

† The correctness of Rasmussen's anatomical statements is not by any means free from doubt. See fig. 1, loc. cit.

of the sclerosed skin, according to the authors named, though presenting a tolerable degree of uniformity, yet yield little or no satisfactory information with regard to the minute tissue changes. In all, the sclerosed skin appeared thickened in structure, the corium especially showed no distinct transition into the subcutaneous tissue, but was rather changed with this into a thick, white, slightly fatty mass of tissue. In places, over the bones especially, the corium, the subcutaneous connective tissue, and the periosteum were closely united (blended into a thick felt). In this way, the close union of the sclerosed skin to the subjacent layer of fascia or to the bone was explained.

The following are the more minute histological changes mentioned :—There was an increase of the connective-tissue fibres (Förster) and of the elastic fibres (Arning) of the skin. The epidermic layer and the papillæ were normal. The glands were scantily represented, but were otherwise normal; around them, however, an unusual number of elastic fibres were found (Arning). The hairs were downy and thinly scattered, bent and brittle (Wernicke), or short, dry, dull, and broken off (Brück, Nordt). Rasmussen (*loc. cit.*, p. 11) agrees with these observations. He lays great stress, also, on a dense cell-accumulation (lymph-cells), which, like a sheath, surrounds the blood-vessels within the range of the scleromatous skin, high up in the papillæ and deep in the layer of fat-cells. These lymph-cells fill the adventitious (lymph) space around the vessels. From these cells are developed connective-tissue fibres, and even elastic fibres.

Like Wernicke, Rasmussen accepts two stages of the disease. So long as these cell-masses are no further organised (first stage) the skin appears thick, swollen, infiltrated (stage of infiltration). Later, when the connective and elastic fibres are formed, the tissue of the skin becomes hardened (sclerosed) and contracted (stage of sclerosis).

At the same time that Rasmussen finds fault with Virchow, who reasons exclusively from an anatomico-pathological standpoint, that all processes attended by chronic inflammation and chronic cedema ("lymphatic") from which result increase of connective tissue and thickening of the connective-tissue structure, are identical, and, therefore, regards elephantiasis Arabum, "pachydermia," scleroderma, and even sclerema neonatorum as synonymous with elephantiasis, he himself falls into a similar

error. From the bare fact that he encountered lymph-cells around the vessels in the sclerosed skin, and that he found the same also in elephantiasis Arabum (*vide* fig. 2, loc. cit., p. 24), he considers we should regard scleroderma as a morbid process identical with the latter, and proposes to give it the name of Elephantiasis sclerosa.*

The microscopic examination of the sclerosed piece of skin which we cut out from the upper arm of the patient, Schira, (*vide* p. 107) gave the following results:—The epidermic layers were normal, the papillæ of normal size and shape. Its connective-tissue framework exhibited a remarkably thick network (narrow spaces). The corium was remarkably thick at the expense of the reticular layer and of the tela cellularis, since the dense connective-tissue network, which is usually peculiar to the upper layers of the cutis, extended into and beyond the region of the subcutaneous tissue, and was equally dense throughout, so that the latter no longer existed as a wide mesh-work containing lobules of fat in its meshes. As deeply as the cut extended, and as far as the fascia of the muscles, the whole tissue consisted of a thick network of connective tissue and elastic fibres. Of the latter, there were numerous bundles and isolated fibres. The region of the subcutaneous connective tissue was recognisable by the collections of fat-cells, which, in our case, were by no means absent, though scanty, and were closely surrounded and pressed together by the densely-packed bundles of connective tissue, so as to form small, oblong masses. The sebaceous glands, hair follicles, and sweat glands were numerous and well preserved, from the bottom of the first and the convoluted extremity of the last, to the openings of their respective ducts (contrary to the experience of Förster and others). The muscoli arrectores pilorum were well seen. The hairs corresponded in their size and condition to those of the locality (upper arm) from which the piece of skin was taken. Their root-sheaths were normal. The vessels were numerous though diminished in calibre, and closely surrounded by connective tissue. In spots here and there, and in large tracts, the connective tissue surrounding both sides of a vessel appeared

* In cases showing a tendency to atrophy, the same enlargement of the sweat- and sebaceous-glands and degeneration of their epidermoidal contents are met with (Neumann) as in other atrophic conditions of the skin.

pushed aside from its walls by small, nucleated (lymph) cells closely heaped on one another. By these cell-masses, the vessel was increased to five or six times its normal breadth, as if enclosed in a cell-sheath. The accumulation of cells was distinctly limited, laterally, by a continuous fibrous border. One may say that the cells were accumulated in the perivascular lymph-space (adventitious space). In places, there were also cell accumulations in the meshes of the network of the corium, without our being able to detect a vessel in the centre.

If we connect the clinical symptoms with the foregoing microscopico-anatomical conditions—and it is only by such a combined consideration that we can draw a conclusion as to the nature of the disease—the result will be as follows:—

1. We cannot (after Forget and others) regard the affection as an inflammatory process in the cutis (chorionitis, Forget), because the clinical symptoms of the inflammation, as well as the histological signs, are wanting.

2. Neither can we (with Rasmussen) consider the process as equivalent to elephantiasis Arabum and pachydermia, because the conditions by which these are produced (obstruction to the circulation, swelling of the glands, frequently relapsing inflammation of the cutis and of the subcutaneous tissue, &c.), are wanting in scleroderma, and, also, because the final result of the changes in elephantiasis, such as massive thickening of the tissue, œdematous infiltration of the tissue, enormous heaping up of new cell-forms and so forth, differs so manifestly from that met with in scleroderma. In the latter, on the one hand, there is never the enormous hypertrophy met with in elephantiasis, and, on the other hand, the final result, the shrinking of the tissue, in spite of the increase of the connective tissue, is always recognised as a pathognomonic phenomenon.

3. We believe we may adduce as essential characters, from a clinical standpoint, the early, very moderate, firm infiltration without any inflammatory symptoms, and the subsequent shrinking and thickening (sclerosis) of the cutis and its subjacent structures. Also, from an anatomical point of view, the increase in the connective tissue (and the elastic fibres), in the corium and tela cellularis; a denser packing of these fibrous elements, in consequence of which there is a narrowing of the normal interfibrillar spaces; as well as, finally, the moderate accumulation of

lymph-cells in the adventitious sheath of the vessels which is believed to be a lymph-space.

If we were to state our opinion of the nature of scleroderma as based on these facts, we should say we believed it to be, fundamentally, a diffused thickening and stasis of lymph in the cutis. In consequence of the thickening of the lymph, which results, not from local conditions, but from a generally abnormal state of the nutritive processes, this stagnates in the interstices of the tissue, which, according to the views as to the commencement of the lymph-passages, are considered to be lymph-spaces. Hence the early, but already firm, rigid infiltration of the cutis. Should the flow of the lymph again become free, then, also, the infiltration disappears completely, and the cutis returns to its normal condition. Should the stagnation continue for a longer time, then, out of the accumulated superfluity of nutrient material, the previously normal connective tissue is formed in excess, becomes denser and increased in quantity. The interstices of the tissue become narrower and narrower, and consequently the latter can only be infiltrated by a smaller quantity of fluid. The connective-tissue texture becomes less and less juicy, retracted, and shrunken, like all slightly juicy connective tissue and cicatrices.

The conclusion mentioned above by us, that an anomaly in the general nutritive processes lies at the foundation of the production of the lymph-stasis, also naturally explains the circumstance that the scleroderma is not localised to the course of the great blood- and lymph-vessels, nor corresponds to the situation of general or local obstruction of the circulation, but attacks the different localities irregularly and diffusely, and, as is well known, is most frequently met with on the upper parts of the body.

Treatment.—In reference to a disease manifesting itself by such intense organic alterations as scleroderma does, we are considerably at fault as to treatment. Originally, when the process in its entirety was less known, and the disease was regarded more as a local lesion, all imaginable, so-called emollient and dispersing salves, plasters, and baths were tried. Before long, the inefficacy of these remedies was recognised, and attempts were made to influence the general organism, alteratively, by means of methodical inunctions of grey ointment and the

internal administration of iodide of potassium, as well as by the use of medicated baths. We have ourselves, also, tried the latter means, without, however, any apparent success. Since the time of Mossler, in particular, and after the experience of the inefficacy of all so-called specific remedies and local applications, a constitutional tonic treatment and diet is mostly indicated, especially the internal use of the ferruginous compounds and of cod-liver oil, combined with the external use of oxide of iron and copper baths, and salves containing copper. Indeed, this treatment has been found efficient. Notwithstanding that Mossler, Köbner, Fagge, Hebra, and others have seen improvement or even recovery take place under such conditions, it still, however, remains undetermined what share the treatment mentioned has in the improvement. From our standpoint, that we regard scleroderma as the expression of a disease of the general organism, such constitutional and tonic treatment, only, can be recommended. In judging of the supposed efficacy of such treatment, it must not be forgotten that on isolated patches, and, in certain individuals, on all the affected parts, the process may even undergo involution spontaneously, in the course of months and years; and finally, that only those alterations which represent the first stage, the so-called infiltration of the cutis, admit of involution either spontaneously or under the influence of treatment. A portion of skin which has once passed into the stage of sclerosis, and especially of atrophy, cannot again return to its normal condition.

CHAPTER XXXVIII.

CLASS VI.—DIV. III. (A.)—(CONTINUED).

1. (b). SCLEREMA NEONATORUM.*

DR. KAPOSÍ.

Scleroma neonatorum, das Sclerem der Neugeborenen; Algor progressivus, Algidité progressive; die Greisenhaftigkeit der Kinder; Decrépitude infantile.

On account of the similarity of this disease in external appearance and in name with the scleroderma of adults, we insert an account of it in this place.

History.—Many physicians of the last century and in the beginning of the present (Andry, Nadeau, Doublet, &c.), gave accounts of Induratio telæ cellularis neonatorum, but Chaussier was the first, quite in the beginning of this century, to describe the induration of the connective tissue of new-born children under the name of Sclerema. And dermatologists, such as Gibert and Alibert,† have since treated of it under a similar designation. It has only been, however, since Hervieux (in the ‘Archives générales de Médecine,’ Nov. 1855, and in the ‘Union médic.,’ Avril et Decembre, 1855), described this disease, and attempted to explain it as Algidité progressive, that physicians treating children’s diseases, already cognisant of the affection, turned their attention more carefully to the subject. And, since then, Löschner,‡ Vogel,§ Bouchut, Bednar,|| Billard, Ritter,¶

* By this designation, which is already much in vogue, we wish to distinguish by name the disease of early childhood, which differs clinically and anatomically from the *scleroderma* of adults.

† ‘Nosologie naturelle, ou les maladies du corps humain distribuées par familles.’ Paris (1817) 1838, p. 494.

‡ ‘Jahrb. f. Kinderheilk,’ p. 91 et sequ.

§ ‘Lehrb. d. Kinderkr.’ Erlangen, 1860.

|| ‘Die Krankheiten der Neugeborenen und Säuglinge.’ Wien, 1853, 4 Th., p. 70 et sequ.

¶ ‘Jahrb. f. Phys. und Pathol. des ersten Kindesalters,’ 1868.

and others have expressed their opinions respecting the disease in question in special treatises, annual reports, and histories of cases, as well as in their text-books on the diseases of children.

Pathology.—The disease makes its appearance first of all, almost invariably, on the lower extremities, and extends from thence upwards on to the abdomen. As the disease advances, it appears on the upper extremities and on the face. It is rare for it to begin in the latter situation and for the extremities only to be attacked later.

The first remarkable symptom is coldness of the peripheral parts of the lower extremities, with simultaneous œdematous swelling and sensation of hardness to the touch, of the affected portions of skin.

The swelling is often only very inconsiderable, but it is hardly ever absent at the commencement. The skin appears stretched; uniformly or in patches, glistening; of a glossy red; here and there, especially on the toes, of a livid red, or else of a deathly pallor; its epidermis is smooth or slightly wrinkled, or superficially fissured by rhagades (fendillé). On touching the skin, a remarkable resistance (scleroma) is encountered; yet, pressure with the finger causes a dimple in the skin (œdema). After some hours, or one or two days, during which time the affection has spread further over the body, the induration has increased on the parts first attacked, the œdema and the swelling have diminished, so that the part has resumed its normal volume, or even appears shrivelled. At the same time, the epidermis is wrinkled, like a skin of parchment. Occasionally, the initial œdematous swelling is quite indistinguishable or not present at all, and the extremities and the parts which become involved in the disease, later, are cold, hard, thin, wasted, wrinkled as if mummified. The temperature always falls gradually, about 2° to 3° C. (3° to 5° F.) daily. The extremities, in this condition, are scarcely or not at all movable. In appearance and to the touch, the impression suggested is that of a child's corpse in a state of rigor mortis.

In the meanwhile, the morbid change has also involved the upper extremities, the face, and a great part of the trunk. The face, especially, on account of the rigidity of the skin, is immovable, the oral aperture lessened, the eyelids are half closed.

Some parts of the face are hard and elevated, others wrinkled and depressed, and the expression has some resemblance to that of the countenance of an old person marked with permanent wrinkles and furrows. In consequence of the rigidity of the lips and of the general immobility, the children can neither suckle nor drink sufficiently, and, therefore, soon sink from want of nourishment. Whenever we touch the child the skin is cold, rigid, dimpled with difficulty, immovable—briefly, in the condition described above.

Children thus affected lie quite motionless, as if half frozen, or they only show signs of life by very slight movements of certain parts of the body, which are less affected. They neither shed tears nor cry out, they only now and then moan feebly.

With these symptoms, or especially with a further loss of temperature, the patients die in the course of from two to ten days, since some one of the internal diseases to be mentioned later, or the general marasmus, hastens or directly causes death. It is but seldom that the fatal result is deferred for any considerable time.

In a few cases, a temporary elevation of temperature and diminution of the sclerema may occur in patches. In still rarer cases, the sclerema completely disappears with the increase of the temperature and of the suppleness, and the child recovers.

Cause.—Concerning the cause of the sclerema neonatorum very various opinions have been expressed. Notwithstanding that these sometimes appear to differ widely from one another, they nevertheless agree, essentially, in this, that the disturbance of the circulation in the capillaries of the peripheral parts of the body is the proximate cause of the structural alteration, and, therefore, also, the cause of the diminution of temperature and of the solid oedema. Opinions differ only as to whether the peculiar change in the skin represents the essence and first step of the process (Hervieux), or whether peculiar morbid conditions of the internal organs, such as are able to set up disturbances of the circulation and diminution of temperature in the peripheral parts of the body, and which must be regarded as having an intimate connexion with the sclerema and as the proximate cause of the fatal result, do, in fact, precede the onset of the sclerema (Meckel, Heyfelder, Löschner, and others).

It is certain that, in the greater number of the cases, such

morbid conditions will either have been observed for a long time previous to the appearance of the sclerema, or will, at least, be detected in the course of the affection of the skin. Such are chronic intestinal catarrh, follicular ulceration of the mucous membrane of the intestine, atelectasis pulmonum, pleuropneumonia, chronic bronchial catarrh, malformations of the heart, patency of the foetal orifices of the heart and great vessels, meningeal apoplexy, hydrocephalus, &c. All these are conditions which may directly cause death, and which, at any rate, are capable of previously acting as impediments to the capillary circulation of the peripheral parts of the body.

A similar effect is produced on the cutaneous capillaries, in consequence of an originally deficient state of the general nutrition (children of feeble vitality), or in consequence of impaired nutrition from bad nursing and food. In this way is explained the circumstance that very emaciated children, in the condition described, are not infrequently brought back, from private nursing, to the Foundling Hospital of this place, and recover again sometimes from the disease by good nursing; so that, in addition to the above-mentioned and similar internal diseases, we may likewise regard the defective nutrition occasioned by external surroundings as a cause of the sclerema neonatorum. We must not omit to mention that in syphilitic babies we have also frequently observed such a sclerema, which occasionally disappeared again, and the children recovered, or else death quickly followed in consequence of it.

Anatomy.—As Förster* and Virchow† have already stated, and we ourselves have found, the skin of children affected with sclerema exhibits no noteworthy characters except the more or less distinguishable oedematous infiltration of the skin, and a dense, rigid, “stearine-like” Panniculus adiposus. There is especially no considerable or demonstrable increase in the connective tissue. The result is, therefore, rather of a negative character, and contrasts prominently with the positive conditions met with in scleroderma adultorum.

Treatment.—As is already evident from the etiology, treatment must be directed, as far as possible, to bring about the removal of the internal diseases, and the defective state of general nutrition to which the origin of the sclerema must be referred. If we are successful in curing the intestinal catarrh, the chronic

pneumonia, &c., then there is also hope of removing the sclerema and of saving the children. That we should, at the same time, endeavour to excite the capillary circulation again, by artificial administration of nourishment and artificial warmth applied to the diseased parts of the body, is sufficiently obvious after what has been said.

CHAPTER XXXIX.

(CLASS VI.—DIV. III. (A.)—CONTINUED.)

2. ELEPHANTIASIS ARABUM.*

PACHYDERMIA (Fuchs); Elephantopus; Das Knollbein; Barbadoes-leg; Barbadosbein; Cochinbein; Bucnemia tropica (Mason Good); Die Drüsenkrankheit von Barbados (Hendy und Rollo); Roosbeen von Surinam (holl.); Hypersarcosis (Kämpfer); Sarcoma mucosum (M. Aur. Severinus); Spargosis fibro-areolaris (Wilson).

History.—Instead of giving an exhaustive account of the voluminous literature and of the history of Elephantiasis Arabum, it appears much more in accordance with the object of a Handbook like the present, to remove the confusion which was produced by the multiplicity of the names and characteristics employed by authors in relation to this malady, and which still exists partly at the present time.

Even in the most recent times, Elephantiasis Arabum and Elephantiasis Græcorum, Lepra Arabum and Lepra Græcorum are still confounded with one another by physicians and writers. This is the case with Hecker, for instance, who in an otherwise valuable monograph† not only makes a fundamental mistake in naming the disease, but also errs in his description of its characters.

When they began in the middle ages, especially in the 13th

* Though the name, Pachydermia, proposed by Fuchs, appears less misleading and more likely to guard against confusion than that of Elephantiasis Arabum, yet we have felt compelled to prefer the latter title; because pachydermia indicates, rather, a matured morbid product, elephantiasis a morbid process. That which we purpose to describe represents, however, as matter of fact, a series of morbid processes, of which the pachydermia can only be regarded as the final product.

† C. F. Hecker, 'Die Elephantiasis oder Lepra arabica' (!), Lahr, 1858, gr. fol., mit. 5 Tafeln.

century, on account of the Greek authors being difficult of access, or partially wanting, to translate the writings of the Arabians, Janus Damascenus called Serapion, Albucasis, Avicenna, Haly Abbas, Rhazes, Ebn Sina, Ben Zoar, and others, into Latin, in order, in this way, to renew the interrupted acquaintance with Greek literature, the Arabic names of diseases were at one time translated according to their etymological, and, at another, according to their nosological signification, and it was in this way that the above mentioned confusion arose.

The Arabic writers, for instance, describe, under the names *dal fil*, *da ool fil*, *da-el-fille*, a local disease, confined especially to the lower extremities, characterised by bulky thickening of the affected part, which is not mentioned at all by the Greeks. *Dal fil* means literally elephantine disease (Mason Good), and therefore this was translated *Elephanta* or *Elephantiasis*.

The Greek medical writers, however, Lucretius,* Aretæus,† Galen,‡ &c., designated by the term *Elephantiasis*, an endemic, constitutional, fatal disease, characterised by tubercular, patchy, and ulcerating formations, the *Aussatz* (leprosy), the *Maltzeyß* of the German authors of the middle ages, the *Spedalskhed* of the Scandinavians.

Consequently, there were two diseases essentially different from one another introduced, under the same name—*Elephantiasis*—into literature; whereby were designated the *Elephantiasis* of the Greeks (*Græcorum*), the severe disease mentioned, and the *Elephantiasis* of the translators from the Arabic (*Arabum*), a local disease.

The translators knew, however, further, that the very fatal constitutional disease described by the Greeks was also accurately known to the Arabians, but described under the names *Judam*, *Juzam*, *Aljuzam*, *Dzudham*, analogous titles to which are still employed|| at the present day in Syria, Arabia, Persia, and Africa. For these names, the translators gave the term *Lepra*.¶

* 'De rerum natura,' Lib. v.

† 'De causis et signis morbi.' Lipsiæ, 1735, p. 67.

‡ 'De causis morborum,' cap. 7, und de tumoribus, c. 14.

§ Hensler, 'vom abendl. Aussatz in Mittelalter.' Hamburg, 1790, p. 22.

|| Niebuhr, 'Beschreibung v. Arabien.' Kopenhagen, 1772. Simpson, J. Y., 'On Leprosy and Leper Hospitals.' 'Edinburgh Med. and Surgical Journ.,' 1842, Jan., p. 126.

¶ But Stephanus, who, as early as the year 1127 translated the works of

Under the same name *Lepra*, however, the Greeks had described* a perfectly harmless disease of the skin characterised by the formation of white scales.

There was, consequently, a *Lepra* (*Arabum*), a very important constitutional disease, identical with *Elephantiasis Græcorum*, and, also, a *Lepra* (*Græcorum*) which was a comparatively insignificant, scaly affection; and it must be noted that the epithets *Arabum* and *Græcorum* did not refer to races of men, but to the authors.

It was owing to this nomenclature, similar in form, but so diverse in signification, that the confusion of names and of ideas arose, and was perpetuated.

Only a few of the earliest translators, as Stephanus, retained the original Arabic designations, as well as the modern Latin names. Subsequent writers adopted only the designations of the Latin translators.

The great number of medical writers, who appeared in rapid succession, at a rate previously unknown, towards the end of the 15th, and in the course of the 16th centuries, owing to the special interest which they felt for the terrible *Lues venerea* at that time making its appearance, had no leisure to enter into the question of the contradictions which existed in the translations of the Arabians, and the writings of the Greeks, in spite of the fact that, owing to the invention of the art of printing, the latter were just becoming again more fully known. The few authors who left the exclusive domain of syphilidology to work in the more comprehensive domain of dermatology, such as *Mercurialis*,† *Lorry*,‡ and *Daniel Turner*§ exerted themselves to reconcile the Arabians, on the one hand, and *Galen*, as the representative of the Hippocratic school, on the other. As this was attempted by *Lorry*, for instance, rather by means of mere phraseology than real explanations, the result in this respect was but very insignificant.

Haly Abbas, gave *Elephanta* as = to *Juzam*, and is consequently in accord with the Greeks (*Simpson*, loc. cit.).

* See, among others, *Hebra*, in vol. ii., p. 3, of this work.

† 'De morb. cutan.' *Venetis*, 1601.

‡ 'Tractat. de morb. cutaneis.' *Parisiis*, 1777, pp. 360-395.

§ 'Abhandl. v. d. Krankheiten der Haut., a. d. Engl.' *Altenburg*, 1766.

The dawn of modern dermatological science at the end of the last century, ushered in by the works of Plenck and Willan and Bateman, did not lead to any clearing up of this confusion. On the contrary, Willan increased this only still more, since he described a mere form of development of Psoriasis as a special disease, under the name of *Lepra Græcorum*,* at the same time that the very similarly sounding name, Leprosy, was already naturalised in England for the important disease, true leprosy (*Aussatz*); and, on the other hand, also mixed up the names and symptoms of *Elephantiasis Arabum*, and *Græcorum*, and even designated the former as *Arabian Leprosy*.†

A want of material for observation, alone, could have led Willan to make this mistake, whilst Alibert could only have been misled into inventing the bastard name of *Lèpre éléphantine* for the local induration of the leg, by his imperfect knowledge of the old authors.‡

During the last thirty years, by the active and rapid communication established between the most remote nations and countries, and manifoldly by autopsies, opportunity has been afforded for studying those forms of disease which, under the names of *Elephantiasis* and *Lepra*, and similar ones, had been handed over from one medical work to another, as if by tradition. When more attention began to be paid to the description of objective phenomena in medicine, as in other natural sciences, the materials obtained by experience were carefully sifted. Many forms of disease considered to be endemic in Europe lost their mysterious and strange appearance (*Scherlievo*, *Sibbens*, &c.), and the almost fabulous diseases of other latitudes became better understood.

Thus it happened that, at length, in the year 1840, Fuchs was enabled to separate the *Elephantiasis Arabum* from the *Elephantiasis Græcorum*, by name, by giving to the first that of *pachydermia*;§ and that Hebra also kept the two diseases distinct

* See Hebra, loc. cit., and *Hautkr.*, v. Rob. Willan, deutsch von Friese, Breslau, 1799, 1 B., plate viii., and *Delin. of Skin Diseases*, London, 1817, plates vii. and lxxviii.

† 'Prakt. Darstellung der Hautkr. nach Willan's System, von Hahemann.' Halle, 1815, pp. 426-450.

‡ 'Description des maladies de la peau.' Paris, 1814, plate 33.

§ C. H. Fuchs, 'die krankh. Veränderungen der Haut.' Göttingen, 1840, p. 702.

from one another.* Indirectly, the valuable labours of Daniels-sen and Boeck on Spedalskhed† assisted very essentially in the explanation, since they gave an accurate description of this disease, which corresponds to the Elephantiasis Græcorum; and, directly, the authors Pruner,‡ Rayer,§ and Rigler,|| who were especially versed in the diseases of the East from personal observation, and also Hirsch,¶ by means of his valuable critical review of the previous literature.

Our acquaintance with Elephantiasis Arabum has been very essentially increased by the exact symptomatology, and especially by the searching, pathologico-anatomical studies which, in addition to the authors just mentioned, Rayer,** then Sinz,†† Hendy and Rollo,‡‡ Simon,§§ Rokitansky,|||| Virchow,¶¶ Teichmann,*** and others, have published, partly in monographs and special treatises, partly in their well-known larger works on these diseases.

Definition.—We use the term Elephantiasis Arabum to indicate a hypertrophy of the fibrous tissue of the cutis, and of the sub-cutaneous connective tissue, affecting the latter primarily, and followed in the course of further development by an increase in volume of all locally implicated, adjacent organs and tissues; caused by local disturbances of the circulation and chronic recurrent inflammation of the vessels and lymphatics, and confined to isolated regions of the body.

* See Hebra, &c., klinische Vorträge, allg. Wiener med. Zeitung, Jahrg., 1857, No. 39, u. 46, und Hebra's Atlas, d. Hautkr., Heft. 4, Taf. 10.

† 'Traité de la Spedalskhed.' Paris, 1848.

‡ 'Die krankheiten des Orients,' von Dr. F. Pruner. Erlangen, 1847.

§ 'Wochenschr. d. k. Ges. d. Ärzte.' Wien, 1855.

|| 'Zeitschr. d. k. k. Ges. d. Ärzte in Wien,' 1855, xi.; 'und die Türkei und deren Bewohner,' Wien, 1852; 2 B., p. 98 et sequ.

¶ Dr. Aug. Hirsch, 'Handb. d. histor. geogr. Pathol.' Danzig, 1860, p. 302.

** 'Traité des maladies de la peau,' ii. édit., T. iii., p. 824, and Atlas, Pl. 15, F. 20.

†† 'De Elephant. Arabum, Dissert. inaug.' Paris, 1842, Tab. ii., fig. 4.

‡‡ 'A Treatise on the Glandular Disease of Barbadoes, proving to be seated in the lymphatic system.' London, 1784.

§§ 'Hautkrankheiten.' Berlin, 1851, p. 51.

|||| 'Path. Anat.' Wien, 1856, ii. B., p. 54.

¶¶ 'Die krankh. Geschwülste.' Berlin, 1863, ii. B., p. 295 et sequ.

*** 'Das Saugadersystem.' Leipzig, 1861, p. 62, Taf. vi., fig. 4.

Symptomatology, Distribution, Seat, Development, Progress.—Elephantiasis Arabum is a pandemic disease, and cases are observed therefore in all countries and zones, either only occasionally or more frequently. In certain countries and on particular lines of coast, especially in the tropical and sub-tropical regions, such as Egypt, the coast of the Mediterranean, the West Coast of Africa, the Antilles (Barbadoes), the Brazils, Malabar, and the Sunda Islands, a great number of cases of this disease occur. In Europe, the disease is met with always in isolated cases, but in all countries and regions.

The most frequent seat for the disease is the lower extremity, mostly the leg and foot; rarely, and then only in the later stages, is the thigh affected. Both lower extremities are scarcely ever affected.

Next in order of frequency, elephantiasis occurs on the skin of the scrotum and penis in males, and of the greater and lesser labia and of the clitoris in females. Less frequently, the upper extremities, the external ear, the skin of the cheeks, the skin around the anus (in Japan, Pruner), and the female breast are attacked. The accounts given of elephantiasis on other parts of the body are to be accepted with caution, inasmuch as the symptoms of the cases of the disease may be regarded as indicative of a pathological change differing from that of elephantiasis, as we shall point out later on.

In spite of their essential similarity, the symptoms of elephantiasis exhibit many very remarkable external differences, according to the locality affected, and there are two forms, especially, which are almost schematically distinct from one another—elephantiasis of the leg and elephantiasis of the scrotum. On this account, we shall adduce these, particularly, as paradigms of the process.

a. *Elephantiasis Arabum Cruris.*

Elephantopus, Knollbein, Barbadoes-leg, Barbadosbein, Cochinbein, Roosbeen von Surinam.

Development, Progress, Symptoms.—The process commences on the leg with symptoms of an erysipelatous inflammation, of a dermatitis. The leg swells, with moderate or more intense febrile symptoms, resembling attacks of intermittent fever. The skin appears reddened and swollen, is painful and hot. The

feverish attack passes off, the febrile symptoms abate. There remains behind, however, for some time longer, a slight œdematous swelling. After some time, but before the œdema has completely disappeared, the attack of inflammation, swelling, and painfulness of the leg and foot returns, in consequence of a direct injury or without any discoverable causative conditions, and is accompanied, or even preceded, by febrile symptoms. These paroxysms return again and again, with intervals of weeks or months, in the course of several years. After each of these paroxysms, some of the swelling remains behind for a long time, and, in this way, must increase in the same proportion as the attacks follow one another at shorter intervals.

If we examine a leg which has been attacked repeatedly by the inflammation described, we shall find, besides considerable increase in its circumference, its skin stretched, smooth, shining, pale or bluish red. On pressure with the finger, we can usually produce a pit, as is common in œdema. But, we convince ourselves, at the same time, that the œdema is, at any rate, slight in proportion to the thickening of the leg, and that the sense of resistance is much more considerable than in ordinary dropsy, anasarca, and resembles that of sclerema.

The greater part of the thickening of the limb arises, manifestly, from an increase and induration of the subcutaneous connective tissue, whilst the cutis itself appears but slightly altered. In course of time, the attacks of inflammation are renewed. Occasionally, a reddish, painful stripe passes from the inflamed leg along the thigh, and can be felt to correspond with the swollen, painful lymphatics (Lymphangitis, Angioleucitis). The inguinal glands on the affected side also become manifestly swollen. Indeed the infiltration of the lymphatic glands may, occasionally, even precede the inflammation of the leg, and on this account, as mentioned, Hendy* names elephantiasis the glandular disease of Barbadoes. If this process has been renewed frequently for many years, the thickening and induration of the leg will have reached a high degree. The bulk of the diseased limb now steadily increases, without inflammatory symptoms, because the persistent œdema, as we shall show later, is the proximate cause of the hypertrophy of the tissues, and the inflammation and consecutive thickening have also attacked

* Loc. cit.

the deeper structures so far as they are of the nature of connective tissue or contain it, consequently fasciæ, walls of vessels, interstitial muscular tissue, periosteum, and bones. In this manner, there occurs a true hypertrophy of the diseased limb, and, in the highest degree of the development, the leg is very similar in shape to that of an elephant. The thickening of the leg begins just below the knee; the circumference may be twice or thrice that of a normal leg, and increases uniformly from above, down to the ankle. The leg, therefore, represents a thick, unwieldy cylinder of monstrous bulk and aspect. The foot has also become a shapeless mass, for the dorsum is considerably arched forwards, like a bolster, and only diminishes somewhat towards the toes, which project slightly from the mass and are also occasionally thickened. When the patient stands, it appears as if the bulky leg were continuous with the mass formed by the foot; only the less swollen part formed by the ankle intervening between the bolster-like swelling of the foot and the thick leg, in the form of a constriction, which becomes evident when the leg is extended.

The skin of the limb, so monstrously thickened, is tightly stretched, slightly glossy, and of a pale, waxy appearance; or brownish-red, or violet-red, and pigmented here and there, or uniformly of a brown colour, or is of a dirty, dusky tint (*Elephantiasis fusca*, s. *nigricans*). The latter is often produced merely by accumulation of dirty, black, epidermic and sebaceous masses, and reminds us of the *Stearrhœa nigricans* of Neligan and Wilson. The epidermis is smooth or slightly fissured, elevated in thin scales or desquamating. It accumulates here and there in thick masses, which are divided by shallower or deeper fissures and cracks into mosaic-like plates and divisions as in *Ichthyosis serpentina*. In the furrows and grooves of the skin, which correspond to those met with normally, but which, on account of the thickening of the surrounding parts, here represent very deep indentations and pits, the epidermis collects in the form of a dirty, yellowish-brown, very offensive pulp, due to maceration by the sweat; and, therefore, more especially between the toes and in the indentation at the ankle.

The surface of a leg affected with elephantiasis is either smooth and even (*El. lævis* s. *glabra*), or here and there tubercous, raised into tubercles (*El. tuberosa* s. *tuberculosa*). The

tubercles are outgrowths of the subcutaneous tissue, which push the cutis before them. On isolated points, or over large tracts, sometimes in the form of a roll surrounding the leg as broad even as the hand, are situated small, single, branched or tufted, wart-like, papillary outgrowths, several lines in height (*E. papillaris* s. *verrucosa*), which, as in *Ichthyosis hystrix*,* are covered with thick layers of dry epidermis; or, under special conditions, are deprived of epidermis and bleed easily or weep. In other cases, red, raspberry-like tumours, without epidermis, are seen, situated on the hypertrophied parts of skin, especially on the toes, on the dorsum and sole of the foot (*Eleph. framboësioides*).

Occasionally, the symptoms of chronic eczema are present on the surface of the thickened leg; there are yellow or yellowish-brown crusts and moist surfaces. Sometimes an ulcer is present, varying in size from a sixpence to the palm of the hand, and possessing the characters usually met with in ulcers of the leg—shallow solutions of continuity, possessing sharply defined, hard edges, and secreting an offensive, sanious fluid. These ulcers arise, not infrequently, in consequence of local injuries (from a blow, a kick, a plaster), or they are, in certain cases, even the precursors and causes of the elephantiasis.

Now and then, one or more vesicles form on the surface of a leg affected with elephantiasis, and, after these burst, a copious discharge of lymph, of a fluid which coagulates on exposure to air, commences and often continues for many weeks—a true lymphorrhœa (Fuchst). From time to time, this discharge of lymph is renewed. We suppose that this depends merely on the temporary occurrence of a moist eczema, though, also, the possibility of an actual lymphorrhœa is not to be disregarded, as it has been observed repeatedly to occur from lymph-vessels which have been wounded or opened in the course of suppuration.†

We will leave the subject of the external characters, as far

* Vide Kaposi (Moriz Kohn), 'Archiv f. Dermatol. u. Syph. Jhrg.,' 1869, p. 417, Taf. iii., fig. 7. v. Bärensprung, 'Beiträge zur Anat. u. Phys. d. menschl. Haut,' Leipzig, 1848, p. 26. Simon, loc. cit., p. 47, Taf. iii., fig. 7. Rayer, 'Traité d. mal. d. l. peau,' loc. cit.

† Fuchs, loc. cit., p. 706, 'nach einem Falle von Sigism. Grass.' (Ephem. nat. cur., Dec. 1, a. ix., u. x., obs. 65).

‡ Compare Liebert in Virchow's 'Spec. Path., u. Ther.,' B. v., ii. Abth., p. 134.

as they are visible on mere inspection, and pass on to the manual examination of the elephantoid extremity. On touching the skin, we experience a remarkable sense of resistance. It is only with difficulty that the skin pits on pressure. The cutis cannot be pinched up into a fold. It is closely united to the subjacent tissues. On pressing deeply, we feel everywhere a uniformly resisting, hard mass of tissue, without being able to separate or distinguish the individual structures, as, for instance, the muscles, from the mass. The bone, that is, the tibia, is also remarkably thickened and indurated, and feels smooth on its inner surface and anterior border, or tuberculated, if pointed or knotty excrescences of various sizes project into the mass of tissue. Occasionally, also, the articular extremities are thickened and expanded (Pædarthrocace of Malabar, Kämpfer). Whilst these appearances increase manifestly from the knee downwards, we can also, by examination with the hand, trace a hard, thick strip, often of the breadth of four fingers, and corresponding to the course of the saphena vein, from the inner side of the bend of the knee to the neighbourhood of the saphenous opening (Fossa ovalis) of the upper part of the thigh. This sclerosed strip, feeling like an indian-rubber band, tolerably well defined inwards and outwards, represents an offshoot of the sclerosed mass of the leg, which surrounds the veins and their accompanying lymphatics in the form of thick, rigid sheaths.

As regards the subjective symptoms, there is but little to be said. The patients occasionally experience stabbing, tearing, boring pains in the extremity, especially when this has been kept for a long time in a vertical position in walking, standing, or sitting. Under these conditions, also, the œdema uniformly increases. By long-continued resting of the leg in a horizontal position, the pains, as a rule, disappear, and the œdema is diminished. The patients suffer particularly when fresh attacks of inflammation occur, for they are very much inconvenienced by shiverings and febrile disturbance, as well as by the local changes. The actual weight of the leg, so considerably increased in bulk, is a constant source of inconvenience to the patient. It is not, however, merely on account of its absolute weight that the leg cannot be at all, or only with great difficulty, moved; the loss of function is, in great part, produced by the organic change, which takes place in the muscles of the calf in the course of the

structural alterations which occur in elephantiasis (see Anatomy).

Anatomy.—On cutting into a limb affected with elephantiasis, the whole of the subcutaneous tissue down to the bone appears as an almost uniformly yellowish-white, glistening, fibrous, fatty (lardaceous) mass of dry consistence, or here and there swollen up and trembling like jelly. When pressure is used, or even spontaneously, a considerable quantity of a clear, yellowish-white lymph escapes, which coagulates on exposure to the air (Hendy, loc. cit., Wiedel,* Virchow, loc. cit.)

In such a mass as that above mentioned, the various tissues can only be distinguished with difficulty, for they all appear converted into connective tissue. The subcutaneous connective tissue is especially increased, and often appears as a fibrous felt, more than an inch thick, saturated with a jelly-like (sulzige) fluid, separated above from the cutis, which is of denser consistence, though, for the most part, scanty, but, below, becoming continuous with the subjacent structures without appreciable limitation. Here and there, it is made up of stiff, glistening, white fibres, and is very firm, almost scirrhus. Because this condition of the connective tissue preponderates in elephantiasis of the leg, we may name this form *Elephantiasis dura*, or *scirrhus*, in opposition to the *E. mollis* or *gelatinosa* to be described later. Here and there, tendinous, glistening, fibrous septa, mark out a nest, a loculamentum, in which is found new, finely fibrous connective tissue of the gelatinous character, several times previously mentioned, which bulges forward beyond the cut surface.

The fasciæ and the intermuscular septa appear also thickened and condensed. The muscles themselves are wholly changed in their appearance, being of a pale brownish-yellow colour, and homogeneous, having undergone fatty degeneration. The bones appear remarkably thickened, and either smooth, but hardened, sclerosed, or irregular on the surface, studded with pointed and tubercular, stalactite-like exostoses, which project into the hypertrophied soft parts, and may be variously amalgamated together. By means of such exostoses, the tibia and fibula may be occasionally united together (Virchow), or the bones of the knee, or of the ankle joints, or the metatarsal bones. In the midst of

* 'Beobachtungen über El. Arab.' Würzburg, 1837.

the sclerosed portions of bone, there are also, now and then, carious or necrosed parts (Hauke*).

Microscopic examination shows that in the very copious intercellular fluid, which, on account of its marked fibrinous coagulation, must be regarded as a fibrinogenous substance, occur a great quantity of formed elements, nucleated cells, like those present in lymph. In addition, between the fibres of connective tissue, there are numerous stellate cells (Maier) containing one or several nuclei, and drawn out into fine fibres, "round or spindle-shaped, young connective-tissue elements" (Wedl†). In this respect, the condition agrees completely with that of chronic oedema of the skin.‡

The most striking feature met with in the diseased parts is the hypertrophy of the connective tissue, which principally involves the tela cellulosa subcutanea. It occurs not only fully developed in the form of broad bands of parallel fibres, or as connective tissue arranged in the form of networks or plaits, but is also encountered in the form of a tissue made up of numerous delicate fibres with many nuclei and cells interspersed—the polynucleated, so-called connective-tissue corpuscles in the act of division.

The corium is neither always nor everywhere altered in the same way. Generally, its structure is more dense. In thickness, it is only increased here and there, corresponding especially with the places which appear papillary and warty on the surface (*vide* p. 138). There, also, the papillæ are considerably elongated and increased in width, just as in ichthyosis hystrix. The corresponding epidermic strata are also accumulated in a concentric manner, like the annual rings of the trunk of a tree, whilst, in other places, the epidermis only shows changes in accordance with the microscopic conditions elsewhere described (Eczema, Pityriasis).

The hair-follicles and the sudoriparous and sebaceous glands, within the considerably thickened stratum mentioned, of the subcutaneous connective tissue and of the cutis, are here and there unaltered; in other parts, they appear to be deficient or to extend unusually deeply, or to be widely separated from one another. This

* Sinz, *loc. cit.*, p. 14.

† 'Grundzüge der pathol. Histologie.' Wien, 1854, p. 460.

‡ See Young, 'Sitzb. d. k. Ak. d. W.,' 1868, Bd. lvii.

condition originates in the remarkable production of connective tissue, owing to which, structures which ordinarily lie close together are pushed asunder or elongated. The same explanation applies to the fact that, whilst some observers have found so many collections of fat-cells in the deeper layers of the elephantoid skin, that they have attributed the disease itself to a formation of fat, as, for instance, Henle, Sinz, Rayer; others, on the contrary, have not found any fat-cells, and were of opinion that they had become destroyed. It appears, therefore, that by the increase of the connective tissue the collections of fat-cells are pushed widely asunder, so that in making a section at one part we shall not meet with any fat-cells, and, at another, many of them will be seen.

It may be shown, also, that by the pressure of the hypertrophied and scirrhus masses of connective tissue, not only the fat-cells but also the glands, hair-follicles, and cutaneous muscles will atrophy and disappear. This is rendered more probable by the fact that, owing to the hypertrophy of the fascia, and the inter-muscular connective tissue, the muscles themselves undoubtedly undergo fatty degeneration and atrophy, and that the bones also, in spite of their general enlargement, of the formation of exostoses and of their induration, nevertheless appear to have undergone absorption and thinning here and there.

The condition of the blood-vessels and lymphatics within the elephantoid tissue is very interesting and instructive in reference to the interpretation of the process under discussion. The blood-vessels, and especially the veins, are numerous and of large calibre; their walls, in some cases, are considerably thickened, in others, thinned. Along with these are veins of narrow calibre, containing much blood-pigment, and others which, being plugged by coagulated fibrine, have atrophied (Bouillaud, Rayer) and are represented by cicatricial lines infiltrated with brown pigment.

Nearly all observers have directed their special attention to the condition of the lymphatics, for reasons sufficiently obvious. Various as are their statements, as also in respect to the blood-vessels, they yet agree with the actual conditions. The lymphatics and the lymph-spaces, the latter, of course, only in isolated foci, frequently show a monstrous dilatation. This reaches from the subcutaneous tissue into the "space" of a papilla (Teich-

mann, loc. cit.). Some of the dilated lymphatics are bounded by considerably thickened walls, in others, the latter are rotten, easily torn (Hendy). In the midst of the sclerosed connective tissue of the elephantiasis are found cyst-like spaces, bounded by walls of dense connective tissue, and containing an abundance of serous lymph besides the jelly-like, young tissue mentioned. It is not improbable that these lymph-sacs are dilated lymph-spaces (as understood by Brücke, Ludwig, and Recklinghausen*), that is, interstitial connective-tissue spaces in which the lymph stagnates. The incompleteness of the limiting walls of such spaces favours this view, as, also, their containing, in part, young connective tissue. Nevertheless, such a lymph-cyst may also arise from the expansion, from the localised cystic dilatation, of a lymphatic provided with limiting walls, though Virchow himself admits that he has never found the communication between such a pouch and the lymphatic.

The popliteal and inguinal lymphatic glands belonging to the extremity affected are often remarkably enlarged and firm, and are manifestly not only hypertrophied, in reference to their stroma, but also contain an abnormally large quantity of cell-elements in their central spaces.

Nature of the disease.—The preceding account of the clinical and anatomical features of Elephantiasis Arabum enables us to answer the question as to the essential character of the disease. Such answer is afforded by the definition of elephantiasis given at the commencement. The process consists in an increase of the connective tissue in consequence of repeated attacks of inflammation of the subcutaneous and adjoining connective tissue.

Important factors in this process are the attacks of erysipelatous inflammation and the chronic œdema. We are not of opinion that it is necessary to regard this inflammation and œdema as of a special character, not having anything in common with the appearances usually recognised under these names. I will only state that every erysipelas is associated with œdema, and that every chronic, persistent œdema (stationary œdema, Rokitansky, loc. cit.) may produce increase of the connective tissue and induration. I will call attention to a circumstance which certainly must have attracted the attention of many physicians. Young people who suffer from chronic

* Stricker, 'Lehre von den Geweben,' Leipzig, 1869, p. 224. Also New Syd. Soc. Trans.

inflammation of the mucous membrane or of the periosteum of the nasal cavities (chronic eczema, scrofulosis), are frequently attacked with erysipelas of the cheeks. These are the cases which support the old-established opinion of physicians that erysipelas of the face is a genuine epidemic disease, or set up by the influence of cold, and which give much more support to the anatomical notion (of Hebra and Billroth) that this facial erysipelas, like the erysipelas of other parts of the body, is really a diffuse lymphangitis. In such persons, in whom, on account of the condition of the internal coverings of the nose, repeated attacks of erysipelas occur, a very disfiguring, firm, doughy swelling and thickening of the skin of the cheeks and of the lips becomes established in course of time and does not easily, or, it may be, does not at all, disappear.

Every chronic recurrent erysipelas, therefore, can give rise to similar appearances, that is, chronic œdema and hypertrophy of the connective tissue. Moreover, œdema, simply, not that which Virchow designates œdema lymphaticum,* may set up a new growth of the connective tissue. The fluid of the ordinary passive œdema is not poor in cell-elements, which take part in the organisation of connective tissue (Young), so that in passive congestion, in consequence of varices of the veins of the leg, for example, without any erysipelatous inflammation, the symptoms of pachydermia may be developed. The more acute an œdema comes on, and the shorter its duration, the more serous is it in its character, and the poorer is it in cell-forms. The more slowly the œdema arises, and the more chronic its continuance, the richer will be the fluid in cell-contents. These cells form, moreover, the most important material for the production of the new connective tissue, and, therefore, chronic œdema leads most readily to hypertrophy of the connective tissue. We may call such an œdema "lymphatic," in regard to its richness in cells, corresponding to that of lymph, and may designate the chronic forms of inflammation which induce such œdema, erysipelas gelatinosum, leucophlegmasia, phlegmasia alba, &c., these names being of value, only, so far as they indicate the fibrinogenous and organisable character of the fluid of the œdema. The importance, therefore, of the appearance of inflammation is less than that of the specially characterised œdema, inasmuch as the

* 'Spec. Path. u. Ther.,' 1 B.

latter appears to be of primary import as regards the new growth of connective tissue. Indeed, all observers are aware that not only in cases of elephantiasis which are ushered in by symptoms of inflammation, does the hypertrophy continue to increase in the later stages with mere chronic œdema, without the occurrence of further paroxysms of inflammation at this time, but, also, that elephantiasis arises from purely passive œdema, unaccompanied, throughout, by inflammation—a circumstance of no slight importance in reference to the etiology of elephantiasis. Moreover, we do not consider the cells of the fluid of the œdema as the exclusive source of the new growth of connective tissue. Virchow's statements as to the division of the nuclei of the cells of the connective tissue, encountered everywhere, are completely in accordance with the conditions met with in elephantiasis. Whether we refer the connective-tissue corpuscles, with Recklinghausen,* to the lumina of the primitive lymph-channels, or regard them and their processes as nodal points of the system of lymphatic canals (Virchow), their anatomical participation in the process cannot be disputed. Consequently, besides the cells of the lymphatic œdema, the elements of the connective tissue, already present, begin to grow, and contribute to the hypertrophy.

According to our view, therefore, the hypertrophy of the connective tissue is due to the combined action of the local excessive collection of nutritive plasma, rich in cells, and of the old connective-tissue elements infiltrated with this fluid and disposed to outgrowth. A view of the pathological process, which has become less improbable since modern physiological histology, besides recognising the importance of the mobile morphological elements (wandering cells) in the process of nutrition, also again accepts the disputed significance of the stationary tissue-elements (connective-tissue corpuscles, connective tissue), and that of the long discarded nutritive fluid.

Etiology.—Every influence is of importance as a cause of Elephantiasis Arabum, which can produce on any part of the body a gradual and persistent obstruction to the circulation of the nutritive fluids, particularly to the escape of the lymph (interstitiellen Gewebssaftes).

As regards elephantiasis of the leg, the causes which may

* Stricker's 'Lehre v. d. Geweben,' loc. cit. Also New Syd. Soc. Trans.
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be specially mentioned are—varicosities of the veins, chronic eczema and ulcers of the leg, and cicatrices of all sorts, which compress the veins and lymphatics at one part, and, therefore, predispose them, at others, to dilatation, weakening, varicosity, &c., and thus maintain a local obstruction to the circulation and œdema. So, also, a thick bone-callus, the result of preceding fracture of the bone, scrofulous, syphilitic, traumatic ostitis, periostitis, necrosis and caries of the tibia, and exostoses of the same, are all well known agents which, either by means of the accompanying chronic inflammation, or by pressure on the vessels, bring about an accumulation of the plasma and hypertrophy. The thickenings of the bones which are found in elephantiasis are in great part to be regarded as primary, and as a cause, rather than as a consequence of the hypertrophy of the connective tissue in the soft parts, though, undoubtedly, in the later stages, a reaction by the latter on the bone results, so that this, now, further increases in thickness. Lupus and syphilis, in the form of gummous infiltration and ulceration* are, not infrequently, exciting causes of elephantiasis. We have several times had the opportunity of seeing exquisite examples of the "elephant-foot," with very great deformity of the toes (on one occasion in such a manner that all the toes were united in a single, shapeless mass, ending in a point towards the front; on the dorsum, the contour of the great toe appeared indicated only by a shallow indentation), the skin of the monstrous, elephantoid leg and of the toes being densely crowded with tubercles of lupus, and presenting, here and there, exuberant growths in the form of *Lupus exulcerans*. Patches of lupus existing, at the same time, on the otherwise normal skin of the thigh, of the trunk, and of the nose, were almost unnecessary proofs of the lupoid character of the tubercles on the elephantoid skin. So, also, we have seen a monstrous elephantoid thickening on both upper and lower extremities at the same time, in consequence of a peculiar new growth which appeared in isolated tubercles resembling very closely those of lupus, and which, in

* The forms of *El. Arabum* caused by syphilitic gummous infiltration are of a peculiar character and produce very remarkable deformities of the extremity affected, and have, often, not been quite correctly understood by surgeons in general. We shall speak of them more in detail in the chapter on *El. Græcorum*. See *Lepra*, further on.

the seven cases which have hitherto come under our notice, was shown to be a malignant pigmented sarcoma.

We have still to mention that infiltration, hardening, obliteration, and suppuration of the inguinal glands are stated to be a cause of elephantiasis, and by observers in tropical regions, and, therefore, in territories where, according to current opinion, the disease should occur endemically. The causes, therefore, elsewhere so repeatedly enumerated—such as, a predisposition of individuals and of races, climatic and physical influences of soil, of diet, &c., are merely general phrases and hypotheses, which require a foundation of fact before they can be accounted of lasting importance in relation to the etiology of elephantiasis. For the present, it is advisable to adhere to the anatomical conditions above detailed which can unquestionably produce elephantiasis.

A predisposition is of course necessary to the production of elephantiasis, but no more so than is required for the development of lupus or psoriasis, for example, on the "healthy skin."

Age, sex, and race do not appear to have any direct connexion with elephantiasis. It is true that elephantiasis seldom occurs before puberty—manifestly because the disease, according to its nature, requires years for its development. The number of cases in the two sexes appears to be equal. With regard to its relative frequency in different races, it would seem that the Ethiopians are the most liable to this affection. Our own opinion on the matter has been previously indicated.

Climate, and the physical condition of the soil (the tropics, sea-coasts, low islands), have been considered no less potential. In former times, communications concerning the disease proceeded entirely from places on the coast, and from tropical islands, and the disease was considered tropical. We think the exotic name (*El. Arabum*) had most to do with this idea. Now that we are able to take a more comprehensive view of the matter, it has been at once found that there are plenty of cases of *El. Arabum* in Europe, not only on the sea-coast, but, also, inland. Here, there is no lack of such cases, on the contrary, our surgical hospitals always find they are too numerous, on account of the inefficiency of treatment.

We will not conceal the fact that it is for the most part people of the working, poorer classes who are the subjects of

elephantopus. This appears remarkable in connexion with the etiology of the disease, since the previously mentioned anatomical causative influences are, in great part, unconnected with position and manner of life—lupus, for instance. We think, however, the non-supervention of elephantiasis may be accounted for by the circumstance that, at first, the œdema was not chronic, and was not increased to such an extent that, at length, the formation of connective tissue resulted. Individuals of the better classes take care of themselves in good time, so that the œdema disappears, whilst those belonging to the working classes, when similarly attacked, continue to go about, allowing the œdema to increase and become permanent, so that, at length, hypertrophy of the connective tissue arises, which can never again be made to subside.

Prognosis.—Generally, the course of elephantiasis of the lower extremity need not be regarded as unfavourable. The patients will be able to get about, though with difficulty, or, on account of the weight of the leg, may not be able to get about at all, but in other respects they experience no direct detriment from the malady, and may live for long. Now and then, we have met with individuals affected with elephantopus who had a cachectic, leukhæmic appearance. The existing fundamental lesion of the process (for example, caries, lupus, scrofula), and the occasional attacks of local inflammation and of fever, may certainly contribute to this result, quite as much as the wretched poverty of the patients, who, for the most part, find it difficult to follow their employment. Hebra has justly called attention (allg. med. Zeitung, loc. cit.) to the fact observed by him, that death may occur in a short time, inasmuch as in conjunction with chills and fever, inflammation of the veins or lymphatics, phlebitis and pyæmia may originate from the parts affected with elephantiasis.

Treatment.—The treatment of elephantiasis arabum cruris can only be called successful when it either leads to the checking of the pathological process, or, further, causes the elephantoid swelling to diminish, and the hypertrophied extremity to return to its normal bulk, and again become useful. A limitation or complete arrest of the process is indeed only conceivable at an early period. If, during the erysipelatous and lymphangiotic inflammation, suitable local antiphlogistic remedies are em-

ployed—cold applications, whilst the inflamed parts show an increase of temperature, and gradually, with diminution of the inflammation and swelling, warm applications—in conjunction with rest and a horizontal posture of the extremity, and sufficiently long continued abstinence from use of the same, then we can understand that the progress of the elephantoid changes may be arrested. We must also mention that some physicians attribute the transition of erysipelas into induration, which is occasionally observed, to the unsuitable employment of hot cataplasms (Virchow*). It must be remembered that Schuh, on the contrary, very often blamed the cold cataplasmata for this result. We are of opinion that the influence of the cataplasmata in either way has been overrated. The temperature of the inflamed part, and the subjective sensations of the patient, as a rule, furnish the indications for the employment of cataplasmata.

As our previous account teaches, the œdema which remains behind after the various attacks of inflammation, or which arises passively from mechanical obstruction to the circulation, is the proximate cause of the swelling and of the new growth of connective tissue; directly, because connective tissue is produced from the elements of the effused fluid, and, indirectly, because the latter, in the form of a copious nutritive plasma, saturates the previously existing, stable connective-tissue elements, and predisposes them to outgrowth and hypertrophy. In attacking the œdema, therefore, we combat the proximate cause of the malady. This is accomplished most efficiently by applying a bandage to the diseased extremity. Hebra, for many years† past, has treated elephantiasis cruris, in a mild and in a severe form, according to these principles, and has attained thereby, more, or, at least, as much success as other physicians who have adopted much more severe and, for the most part, hazardous or fatal methods of procedure. Hebra's plan is as follows:—After the inflammatory symptoms have been subdued by moderate local antiphlogistic measures, employed in the way mentioned above, and have disappeared, he uses cataplasms and tepid baths, or coverings of oil, adeps or ointments in order to soften and remove the thick accumulations of epidermis and the crusts which exist. When

* Virchow, 'Spec. Path. u. Ther.,' 1 B., p. 219.

† See, among others, 'allg. W. med Zeitung. Jhrg.,' 1857, p. 184.

this is accomplished, inunctions of grey mercurial ointment into the parts affected are practised, absorption being more easily effected after the removal of the thick masses of epidermis. If it is in any way possible to promote the removal of the accumulated exudation, this method is preferable to any other. A horizontal or somewhat elevated position of the extremity affected, in conjunction with inunctions, will, in such cases, certainly produce a marked improvement, which can be tested from time to time by measurement of the circumference of the limb. By this procedure, the limb, which was previously painful, becomes so quiescent that compression of it by a bandage may be undertaken. A roller, only, must be employed, for the gypsum, starch, dextrin, and liquid-glass bandages do not answer, because it is a necessary part of the treatment to re-apply the bandage as often as possible. The extremity, especially in the early part of the treatment, when there is a good deal of serous exudation present, which is easily absorbed, diminishes so quickly in bulk that the bandage, however firmly it may have been applied at first, begins to get quite loose even within twelve or twenty-four hours. Moreover, neither linen, nor even flannel, but cotton bandages must be employed. These are dipped in water and applied as tightly as possible, wherefore it is necessary to have the help of assistants during this manipulation. We begin the bandaging behind the toes and proceed in an upward direction in such a way that each turn overlaps the greater part of the preceding one. In this way, we can exercise very considerable pressure, which certainly would hardly be borne by people in general, but does not seem particularly to affect those who are the subjects of *E. Arabum*. It is merely necessary to take care that the edge of the bandage does not press anywhere, and that if an indentation is noticed at any part it shall be filled up with charpie, or with a graduated compress. Nevertheless, the bandage will become slack even in a few hours, and in the course of half a day will be quite loose. After the removal of the bandage, we often find a diminution in the circumference of the leg to the extent of half an inch or an inch, and we then again apply the bandage tightly. Later, when the serous infiltration is in great part removed, and the diminution of bulk proceeds more slowly, we may renew the bandage less frequently. If during this treatment, inflammation of the enveloped part

should again arise, then we must immediately remove the bandage and employ cold and, subsequently, tepid cataplasms, and inunctions of grey ointment as before indicated.

The diminution in bulk of the elephantopus in this mode of treatment manifestly results from the subsidence of the œdema. Since the latter, by its continuous existence, increases the hypertrophy as previously explained, the treatment exercises a good influence in a double sense, *pro momento et pro futuro*. That, in addition, the existing, maturely formed connective tissue can be broken up and caused to undergo absorption is indeed hardly to be expected, still less can it be proved.

It would appear that surgeons thought they could act effectually in both directions when they undertook and undertake compression of the femoral artery by means of the finger or of the tourniquet (Vanzetti*), or the application of a ligature to it, or even to the external iliac artery, in elephantopus. Owing to the stoppage of the circulation, and its diminution after the establishment of the collateral circulation, the whole process may not only be checked, but may even undergo involution. Dr. Carnochan,† in New York, was the first who, in the year 1851, practised ligature of the femoral artery for this purpose. He subsequently performed the operation in three other cases, and once on both femoral arteries. After him followed Statham, in London, Butcher in Dublin, Fayrer in Calcutta, Alcock in Staffordshire, Bryant‡ at Guy's Hospital in London, Buchanan in Glasgow, and others; here, in Vienna by Weinlechner, and by George Fischer§ in Hanover. With the exception of a few cases, in which the patients suffered from hæmorrhage or died of pyæmia, the operator had a successful result to record. That is to say, that at the end of a month the extremity was much less bulky and better adapted for use. If we consider that after this operation the patients were compelled for weeks to remain in bed in a horizontal position, it becomes quite evident that the diminution of bulk corresponds to a great extent

* (Padua) 'Gaz. des Hopitaux,' No. 144, p. 572. Canstatt's Jahrb., 1867.

† 'Journ. of Cut. Medicine,' vol. i., p. 188.

‡ 'Journ. of Cut. Medicine,' vol. i., p. 180, by Dr. Buchanan; and 'Med. Chir. Trans,' vol. 49, 1866, by Mr. Bryant.

§ 'Archiv für path. Anat. und Physiol.,' 46 B., p. 328.

with the diminution of the œdema, which results under any circumstances from a horizontal position of the extremities. In fact the œdema and increase of bulk became re-established as soon as the patients again walked about. Under such circumstances, we might almost advocate amputation of the thigh in advanced elephantopus. With a wooden leg, a patient may at least get about, who, with a monstrous elephantine foot, is usually quite helpless. This operation has, however, already been frequently performed, among others in a patient at the department for skin diseases here, by Dittl. The greater number of these patients, as indeed was the case with the one last mentioned, have not borne the operation—they have died in consequence of the operation.

When we consider, after what has been stated, that demonstrable success in the treatment of elephantopus can only be attained by diminution and arrest of the œdema, and certainly by means of Hebra's plan of treatment described above, as effectually as possible, and without any danger to the life of the patient, whilst the surgical operations, mentioned, in successful cases, only achieve the same result, and, in the remainder, may be dangerous or fatal to the patient, we can only recommend for imitation the moderately antiphlogistic method of cure, the inunction of grey ointment, and the methodical application of the compressive bandage, in the treatment of elephantiasis cruris.

b. *Elephantiasis of the Genitals (of the Scrotum, Penis, Labia Pudendi, or of the Clitoris).*

Next to the skin of the lower extremities, the most frequent position in which we meet with elephantiasis is on the genitals, scrotum, penis, labia, and clitoris. The skin in this disease becomes hypertrophied to such a remarkable extent that a monstrous outward deformity of the affected structure results, and also an important alteration in the subjacent organs.

In the description of this form we may with confidence follow the account given by Pruner,* who has observed a greater number of these cases than we have ourselves; so, also, indeed have Reyer and Rigler; for, in European countries elephantiasis of the genitals is only met with as a sporadic affection. The elephantiasis scroti develops most exuberantly, for in this affection

* Loc. cit., p. 327.

the scrotum enlarges till it forms a purse-shaped "fleshy" mass hanging down below the knees, or even as low as the ground. It is suspended, by its upper, stalk- or neck-like portion, from the inguinal region, and, on account of its connexion with the groins, has been described by certain authors as *hernia carnosae* (Prosper Alpin, Larrey), or *sarcocele*, or *endemic hydrocele*.

In respect to the development of elephantiasis of the scrotum, no observations are forthcoming, for the disease is always fully developed when first seen. "Though we—says Pruner—have distinctly observed *erysipelas* during the formation of elephantiasis of the prepuce, it has never happened to us to do so when the scrotum was affected. It is true we see these cases usually for the first time in an advanced stage, but we have always received the answer 'no' in reply to any questions as to the presence of such symptoms. The disease has always commenced in the scrotum, so far as we have been able to discover its origin, in the form of a hard kernel under the skin, usually at the bottom of the left side of the scrotum. In proportion as this kernel spreads in all directions, the skin over it becomes thickened and indurated, and appears furrowed, canaliculate, wrinkled, and glandular. At this period, also, the lower part of the abdomen becomes altered in form; it is elongated, whilst the lower extremities appear to be getting shorter—a result of the traction which the tumour exercises on the skin of the abdomen. The penis also increases in the same proportion. If left to itself, the tumour develops steadily at the expense of the adjacent skin. This descends from the pelvic and abdominal wall to add to the size of the scrotal tumour. In the same way, the skin of the penis yields to the traction of the tumour, and turns downwards, beginning at the root. Hence this organ visibly diminishes in length, externally, till it is completely hidden in the tumour. Its cutaneous covering is connected merely to the glans and forms a blind canal, whose aperture is situated in front, in the middle line of the tumour, and represents a kind of continuation of the outer extremity of the urethra (Reyer's '*Harnschlauch*'). The skin of the penis, moreover, in consequence of the contact of the urine, becomes converted into mucous membrane. A sort of gutter sometimes runs downwards from this urinary channel to the bottom of the tumour. Rarely, also, excoriations may occur from the contact

of the urine, but this gradually passes in the direction of the gutter mentioned, after the transformation into mucous tissue."

It is not until the later stages that the elongated, dilated, and ruptured lymphatics allow lymph to transude from their extremities or walls. In this way, the crusts are formed which are mentioned by writers. "This, however, is not constant, even in the most extreme cases." This lymphorrhœa, according to Hendy (loc. cit., 118), Wiedel,* Fuchs (loc. cit.), and others, is, however, to be regarded very often, like that from the leg, as a mere flux such as is met with in eczema, in which disease a very large quantity of albuminous fluid, which dries up into crusts, is often secreted from the exposed papillæ. It is but rarely that the exudation occurs from the interstices of the connective tissue, or at all manifestly from a dilated lymphatic, in which case, only, can we speak of a proper lymphorrhœa. The exudation may at one time originate from an injured part, for example, after the application of a blister and rupture of the vesication; at another time, after spontaneous cracking of the elephantoid skin (*Pachydermia lactiflua*, Fuchs).

The tumour becomes altered in appearance and form in different parts and according to external conditions; thus, for example, it is smooth where the thighs are in contact with it and support it behind. Above, it is always narrow and is attached to a sort of stalk. Usually, it is at first round and afterwards becomes pear-shaped. The skin, especially below, is thickened and traversed by small gutters. Here and there, it has a glandular, papillary aspect. The hypertrophied scrotum may form a tumour which descends below the knees, is of considerable weight, as much as 120 lbs. and more, and of correspondingly immense girth, and which seriously impedes progression. The latter inconvenience is increased by the fact that a considerable inguinal hernia frequently exists also. The præputium clitoridis may grow into a mass 3 lbs. in weight; the nymphæ may descend as low as the knees and weigh many pounds.

Elephantiasis also attacks the external ear and its neighbourhood, but less frequently than the parts above mentioned. The ears and the adjacent parts of skin hang down on the side

* 'Ueber El. Scroti, mit Ergiessung lymphatischer Flüssigkeit,' Wurzburg, 1837.

of the neck, in the form of thick, purse-shaped appendages mostly narrowing towards the upper part in the form of a stalk, so that the ear takes a horizontal position and is situated on a level with the border of the lower jaw.

Anatomy.—If the thickened skin of the scrotum be cut into, a great quantity of yellowish-coloured fluid, which quickly coagulates on exposure to the air or on boiling, escapes from the dense tissue, at first spontaneously and subsequently on the application of pressure. This peculiarity, however, also belongs to any fluid met with in the tissues or in exudations, for example, the contents of a bulla in Erysipelas bullosum or in pemphigus. The corium itself appears to be but slightly changed. The principal alteration is met with in the subcutaneous tissue, which is converted into a hard, scirrhus, white, fatty, and here and there distinctly fibrous mass (El. dura). The more deeply we penetrate, the more uniformly soft and gelatinous does the whole tissue appear (El. mollis). Elephantiasis dura and mollis, therefore, are not, as has been represented by some, two forms of disease distinct from one another and perhaps peculiar to different regions of the body. They can only be regarded as indications of the consistence of the hypertrophied structures in a particular locality and, as has been shown, a transition may even occur at the same spot from the hard into the soft variety. Just as in the elephantiasis cruris, so, in this form, we also meet with cyst-like spaces, bounded by scirrhus tissue or traversed by strong processes of connective tissue, as in abscesses, and filled with a gelatinous mass of tissue abundantly saturated with fluid. The structures which are implanted in the skin, the glands, hair-follicles, and lobules of fat, are pressed widely asunder, and in places are met with very deeply situated.* The organs which are surrounded by the elephantoid skin are also altered in structure. The tunica albuginea of the testis is stretched and thickened; between it and the tunica vaginalis there is more or less thick serum mixed with false membrane. Hydrocele is often present. The testicle itself is occasionally (once in ten cases, according to Pruner) degenerated into a muco-purulent fluid. According to Pruner, the muscles of the thighs also become atrophied in consequence of the pressure of the scrotal tumour.

* Among others, 'De arabum Elephantiasi,' Dissertat. Inaugur., Robert Fränkel, Vratislaviae, 1857.

Distribution and Cause.—The forms of Elephantiasis Arabum, just described, are met with much more frequently, and in a higher degree of development, in certain countries, especially in the East, and on the sea-coast in tropical and sub-tropical regions, than in the countries of central Europe, where the disease invariably occurs only as an isolated and very rare pathological phenomenon. Even in those countries and nations, however, to which more attention has been directed in this respect, as Egypt, for instance, no etiological cause has been discovered to account for the production of elephantiasis of the genitals or for its frequency. Causes analogous to those which produce *El. cruris* cannot be adduced, as erysipelatous and lymphangiotoxic attacks of inflammation have only been observed with extreme rarity, never in scrotal tumours (according to Pruner); and, just as infrequently, have passive or active disturbances of the circulation been noticed as precursors of the elephantiasis. In this respect, this form of Elephantiasis Arabum must be distinguished somewhat from that described under *sec. (a)*. The real nature of the process, as well as the termination, the macroscopic and the microscopic changes, are the same in both. Essentially, it consists in an hypertrophy of the connective tissue, in the first place of the subcutaneous tissue, in consequence of the long-continued presence of an abnormally large quantity of nutrient fluid in the interstitial tissue-(lymph-) spaces; a long-continued preponderance of the existing nutrient fluid over the outflow through the lymphatics. Age and sex do not appear to exercise any influence etiologicaly. It is, however, true that this form of elephantiasis does not develop and come to maturity before puberty. The Ethiopians are more disposed to elephantiasis of the scrotum and of the labia than individuals belonging to other races, who have immigrated; as Pruner points out. To them, also, are generally ascribed from birth, as a peculiarity of the race, a larger prepuce and larger nymphæ and clitoris.

From these facts, and from certain other climatological and physico-geographical conditions, not here further explained, a kind of etiological theory may undoubtedly be deduced, which every one may construct for themselves according to their own mode of thought, but which, however, cannot in any case amount to more than a mere hypothesis.

Treatment.—In the first place, we must renounce any hope of restoring the hypertrophied masses of connective tissue and the muscular and parenchymatous organs, which have become altered in character, owing to the effects of the pressure of the former, to their normal condition. Even to diminish the size of the elephantoid tumour, by promoting the absorption of the considerable and persistent (lymphatic) œdema, in the manner described in speaking of elephantiasis cruris, is not possible in this form of the disease. The, for the most part, pendulous tumours of the labia, of the scrotum, &c., are not even amenable to methodical compression by means of bandages. No success has followed the employment of internal medication, and, indeed, none could be expected.

Though there may be no danger to the patient necessarily arising from the affections described—unless it happens that a heavy scrotal tumour becomes gangrenous, owing to severe injury—these dependent and very mobile tumours, nevertheless, produce such a great degree of inconvenience and deformity, that their removal or diminution is urgently indicated. This will be best attained by operation, after the example of Gaëtani-Bey, and, later, of Clot-Bey, Grassi, Pruner, Reyer, Koch, Schledehaus, and others, both as regards the amount and permanency of the success obtained.

The operation consists in the removal of a sufficient portion of the thickened, elephantoid integument, and must, at the same time, be what is called a plastic operation, whereby the part may be restored, as far as possible, to its normal aspect.

As regards the elephantiasis of the scrotum, the following rules hold good, according to Pruner (*loc. cit.*, p. 331): “Whether the operation is of a simple or of a complicated character depends upon whether the penis is free or already hidden in the tumour. In the first case, after the patient has been placed in the lithotomy position, whereby the tumour is properly supported and the penis bent backwards, above, two lateral, semi-lunar incisions are made from the end of the scrotal raphé, where it is in contact with the root of the penis, towards the margin of the anus. These incisions mark out the two oval flaps which, when carefully dissected up, form the artificial scrotum. After these two flaps have been made, the testicles and the spermatic cords are freed by downward cuts, on each side, at right angles to

the flaps and by careful separation of the tissues beneath ; and, any existing complications, as hydrocele, for instance, having been removed, then the portion of the tumour attached to the perineum is carefully and thoroughly excised, when the whole mass of the tumour falls away. A few touches of the knife at the root of the penis are still occasionally required. The arteries are twisted or ligatured according to circumstances ; the testes and spermatic cords, which, in the meantime, have been wrapped up in a warm cloth, moistened with mucilage, and placed on the abdomen, are now brought down and enclosed in the two lateral flaps, which are brought into the closest possible apposition, and retained there by means of stitches, sticking-plaster, &c. The ligatures are brought out at the lower angle of the wound. If, however, the penis has already become buried in the tumour, then the operation undergoes several modifications. These are, the formation of an oblong, quadrangular flap of reserve to cover the penis, the formation of two oval lateral flaps, as in the first case, to form an artificial scrotum, the removal of the pouch formed by the original covering of the penis, the separation of the testes and of the spermatic cords from the surrounding mass ; next, any complications are dealt with, for instance, inguinal hernia, abscess of the testis, then the division of the pedicle of the tumour in the perineum is accomplished, and, lastly, the covering in the testes, the ligature of the vessels, the uniting the flaps, &c., as in the first case, are carried out.

“The chief difficulties are met with at the angle between the root of the penis and the anterior extremity of the testicular flaps. For it is very usual for an ulcerating, triangular patch to form, here, at the junction of three lines of skin, which only scars over very slowly. Another drawback is the tendency which exists for certain portions of the covering of the penis, which formerly served as channels for the urine, and are now restored to their position, to pass into gangrene. Where it has been unavoidably necessary to leave and make use of certain portions of skin which were not thoroughly healthy, the condition of these will be found to improve, not merely during the suppurative and cicatrising stages, &c., but also after the cicatrisation has been accomplished.” Though we have quoted the chief points in connexion with the operation from Pruner, the

procedure must be modified in any individual case, of course, according to the special circumstances which are present.

The forms of elephantiasis of the leg and of the genitals, which have hitherto been described, have these essential characters in common: moderate hypertrophy of the connective tissue, abundant lymphatic œdema, and the circumstance that they are always acquired diseases, that is, they always make their appearance, first, in the course of extra-uterine life, and indeed, for the most part, not until after the time of puberty. To these forms we may add a third kind of hypertrophy of the skin, which, whilst it undoubtedly differs essentially from the elephantiasis hitherto described, yet also affords many points of similarity to the first forms, and which we will designate, with Virchow* and Hecker,†

c. *Elephantiasis Teleangiectodes, or Lymphangiectodes.*

This form of hypertrophy is always congenital, occurs in acephalous and other monsters, and involves, frequently, the whole body, or, in viable individuals, is confined to a few localities, or to one region of the body. It remains, during later life, of the size and condition it was at the time of birth, or it develops, in after life, to a monstrous deformity. Under this term, we include those structures which are described and demonstrated by Rokitansky and Schuh as new growths of the skin, and more especially of the subcutaneous tissue, which are finely lobulated on the surface, and contain, in their interior, young connective tissue and numerous blood-vessels. That is to say, cutaneous tumours of lobulated structure (Rokitansky‡), which, whilst originally consisting of tolerably well defined tumours, lobulated like glands, richly supplied with blood-vessels, and confined to certain districts, develop into a more diffuse, elephantoid hypertrophy of the skin, and of the subcutaneous tissue, spreading over larger tracts of skin.

* Loc. cit., p. 317.

† Loc. cit., Taf. 1, and text.

‡ 'Lehrb. d. path. Anat.,' 1 B., p. 203 et sequ.

Inasmuch as the subcutaneous connective tissue is primarily and chiefly affected in this kind of morbid change, and the process, by continued extension, becomes diffuse; as, also, the external appearance and various essential, histological, and clinical features are similar to those met with in elephantiasis, we consider ourselves quite justified in ranking this pathological formation with Elephantiasis Arabum.

In Elephantiasis Teleangiectodes, the skin of a considerable portion of the body, for example, of the whole upper extremity, appears hypertrophied in such a manner that it is too large for the corresponding part of the body. It hangs down from the limb, therefore, according to the laws of gravity, in the form of broad, long rolls and folds, just like the skin on the necks of cattle, the so-called dew-lap of the cow. These dependent rolls of skin are marbled of a pale and bluish red colour, on the surface, from the abundance of the vessels which are seen through the, in some places, thinned, and, in other places, thickened cutis. On lifting up one of these flaps of skin, we find it feels heavy and, at the same time, soft as dough; in other places, tolerably firm, and in many places, also, it feels like a fully distended sponge. If the mass is compressed in the hand, it can easily be diminished in size, but the rolls quickly return to their former volume when the pressure is discontinued. At the same time that from the lower part of the circumference, of the upper extremity, for instance, these dew-lap-like cutaneous folds are suspended, and, on this side, the extremity appears thicker, we find that, above and in front, the arm is wasted and surrounded closely by the cutis, which is thin, and stretched by the dragging of the heavy flaps; the muscles and bone are atrophied. The atrophy of the muscles, in addition to the weight of the pendulous flaps, prevent the patient from using his limb. He lifts his arm only with the help of the sound one, and usually supports it in a sling. The fingers also become atrophied, slender, variously curved. The upper arm also becomes sensibly atrophied above the part affected with elephantiasis as high as the extremity of the shoulder.

Whilst I was attending the Hospital, as a student, a young man came under care with a similar affection of his left arm. Since that time I have seen him repeatedly at the Hospital, till he died, two years ago, after amputation of the affected arm at

the shoulder-joint. What Rokitsansky relates (*loc. cit.*, p. 207) respecting a journeyman joiner would apply to him literally:—"I know the case of a man who suffers from a monstrous tumour which extends over the whole of the right upper extremity, it even passes across the axilla on to the thorax. It is slightly tuberculated, shines with a bluish tint through the skin, which is remarkably thinned, especially over the protuberances, and adherent, and it yields to the touch a soft, swelling sensation resembling that of an atrophied lung, at the same time it allows the blood contained in it to be squeezed out of it easily by pressure, as if it were a sponge. The bones of the fingers are wasted to thin rods with sharp angles." Precisely similar, tumour-like, pathological productions of the skin may be seen on the back, on the thigh, on the face, and on the head, &c.

If we have the opportunity of observing the progress of these changes in the skin of which we are now speaking, over a period of several years, it becomes evident that this monstrous elongation and thickening of the skin proceeds from those small tumours which are lobulated like a gland, are, for the most part, congenital, and, budding forth from scattered points of the subcutaneous tissue, grow into the skin, and which, in an early stage, represent subcutaneous teleangiectases, or firmer, lobulated, lipomatous tumours. From a pathologico-anatomical point of view, Rokitsansky has declared these formations to be new growths (*loc. cit.*), and such they undoubtedly are; but, the clinical physician finds the limitations of hyperplasia and of new growth effaced almost as frequently as the anatomist.

The structures mentioned belong, therefore, in great part, to the subcutaneous connective tissue. The connective tissue shoots out into pouch-like or dendritic vegetations; the increase, enlargement, and new growth of blood-vessels keeping pace at the same time with these. Here and there, also, lobules of fat occur between the cones of connective tissue possessing separate blood-vessels. Thus it happens that, at one time, on inspection, the abundance of blood-vessels in the subcutaneous tissue and in the corium attracts attention, and the appearance is that of teleangiectasis, and so, also, is the sensation communicated to the touch; the structure pales on pressure, and immediately resumes its vascular appearance. Or, the connective tissue or fat-lobules pre-

dominate, and the structure feels more or less firm, and resembles more the molluscous or lipomatous tumour.

Such structures, as is well known, but rarely remain unchanged. If the growth of the blood-vessels predominates, if they multiply, spread, communicate freely with one another, and extend superficially in the cutis, there results the "vascular spongy tumour" (Gefässschwamm) ("lobulated vascular fungus," Schuh). And, if this freely anastomosing, vascular network, undergoing free, interstitial hollowing out and amalgamation of the lumina of the individual vessels and the formation of ill-defined cavities containing blood, also occupies the space of the subcutaneous tissue, then there results the cavernous blood-tumour (Rokitansky). These new growths have, for the most part, for their groundwork, an outgrowth of connective tissue varying in direction and form. They may be papillary, dendritic vegetations, solid, clubbed masses, or hollow pouches containing vascular loops.

If, in this further development, the growth of the connective tissue takes a principal share in proportion to the bulk, then there results that form of hypertrophy of the tela cellularis described by us, in which the abundance of the blood-vessels must also attract our attention—we have the Elephantiasis Teleangiectodes. Rokitansky, moreover, does not forget to mention that, though he thinks proper to define the cavernous blood-tumours as new growths, yet, in different parts, a different density of the tissue will be recognised, and that, here and there, "parts occur which appear to the naked eye as white, solid masses." And the latter, which form the predominating constituents of the dependent folds of skin, afford a basis for the elephantoid process. The great abundance of blood-vessels present in the congenital, pathological formation has become further developed with the hypertrophy of the connective tissue, and is the cause of the vascular, sponge-like aspect, and therefore of the Elephantiasis Teleangiectodes. The connective tissue is, as in elephantiasis, here and there fully developed, and consists of broad bands of thick fibres, which, joined together in bundles, and riband-like, white, rigid, glistening, hard, almost scirrhus strips, cross over other similar ones, and thus, here and there, form a thick felt of connective tissue. In other parts, small or large gaps, spaces, or even cystic cavities

are formed, which are filled with a bloody or, as is not unfrequently the case, with a synovial, colloid-like fluid (Rokitansky). In other parts, the connective tissue is more gelatinous, swollen up, and very finely fibrillated—young connective tissue. Temporarily there may be observed, over a considerable extent, an oedematous infiltration of the whole tissue, which is characterised during life by a waxy, alabaster-like, semi-transparent condition of the affected part. This so far disappears again, that a firmer, dryer condition of the tissue is revealed, and, also, the abundance of blood-vessels can be better seen. The distribution of the vessels which, as described, are immensely dilated, here and there varicose, opening into cavities, and united into a dense network, is unequal. Hence, from this local preponderance of the connective-tissue portion in one place, or of the vascular portion of the morbid mass of tissue in another, results the different impression which the observer obtains, and the different explanation which may be offered.

In addition to the very remarkable and, indeed, essential participation of the blood-vessels in the morbid process described, it is only necessary to mention, in regard to the pathological condition of the lymphatic apparatus, that slits, gaps, and even cystoid spaces (see above) are met with in the midst of the masses of connective tissue so richly supplied with a network of blood-vessels, and these gaps have been rightly regarded as dilated lymph-spaces. Inflammatory affections of the efferent lymphatics from the diseased portion of skin are, on the other hand, only observed as temporary phenomena, as is the case in other chronic disturbances of the nutrition of the skin, especially those of a hypertrophic nature.

Prognosis.—As regards the result of Elephantiasis Teleangiectodes, and its significance to the patient, we cannot speak favourably. Apart from the fact that the condition involves, directly, a very great disfigurement and burden to the patient; that he cannot use the diseased extremity; that erysipelas, eczema, hæmorrhage, gangrene, &c., may, temporarily, attack the dependent folds of skin; and that the organs (the muscles and bones) situated above and below the elephantoid part, undergo atrophy, the affection also exercises an unmistakeably bad influence on the general condition of the patients. They

become cachectic in the course of years, and die of exhaustion or of some directly resulting, intercurrent, acute disease.

The treatment of Elephantiasis Teleangiectodes is to be undertaken according to the rules which surgery prescribes for vascular, connective-tissue new growths. In an early stage, when the tumour has not attained a large circumference, it is possible that extirpation of the tumour, immediately followed by cauterisation of the blood-vessels radiating outwards into the surrounding structures (actual cautery, galvano-cautery), may result in improvement or even in a permanent success. In cases which have advanced further, none of the surgical procedures indicated will be attended with any permanent success.

CHAPTER XL.

(CLASS VI.—DIV. III.)

B. CIRCUMSCRIBED HYPERTROPHY OF THE CONNECTIVE TISSUE.

FRAMBŒSIA.*

PIAN, Yaws of many authors; Pian Ruboide, Mykosis frambosioides, Alibert; Beerschwamm, Fuchs; Gattao, Ver-ruga (Peru).

The name Frambœsia was introduced by Sauvages,† who described the affection (loc. cit., p. 554) as *fungi coloris rosei, vel pallide rubri, granulosi, seu papillis exasperati, mucositate rufescente continuo madidi, nulli ulceri sed cuti adhærentes*. He states that frambœsia occurs as an endemic, contagious disease in the West Indian Islands and in Africa. Excrescences like raspberries (Pian‡) or strawberries (Yaw§) become developed on the skin, mostly, in the first instance, on the genitals and at the anus, and, later, on the other parts of the body also, in the axilla, &c., and they heal under the influence of mercury. Yet, according to Sauvages and his authorities, these contagious, endemic, raspberry-like excrescences, which heal under the influence of mercury, are wholly distinct from syphilis.

Plenck|| follows Sauvages in this matter, without having arrived at any independent conclusion. In Class ix., *Excrescentiæ Cutaneæ*, of his system of skin diseases (loc. cit., p. 101), frambœsia is described as a disease, in quo prægressis pustulis variolis valde similibus excrescentiæ fungosæ mori fructus referentes,

* See Kaposi (Moriz Kohn) on the so-called Frambœsia, and several other kinds of papillary new growths of the skin, in the 'Archiv für Dermatologie und Syphilis,' Jhrg., 1869, 3 Heft, pp. 382-423, and Taf. 3.

† 'Nosol. Method. Amstelod.,' 1768, Tom. ii., p. 554.

‡ According to reports by Pat. Labat and D. Virgile.

§ 'Doctr. de Morb. Cutan.,' Viennæ, 1783, p. 101.

|| Crabæ Virides, Sauvages; (Planta nocturna, Sera nocturna, Avicenna; Essera noctis, Sayre, Haly-Abbas) (!).

præcipue in plantis* pedum, quandoque in toto fere corpore excrescunt. Morbus hicce Americanis est endemicus† et licet mercurio curetur, et per coitum inficiat, tamen venereus non censetur genitalia maxime afficit.

Willan and Bateman have also included frambœsia in their system of skin diseases, as the ninth genus of the seventh order—Tubercula. They define it as consisting of imperfectly suppurating tumours, which, from mere specks, increase gradually to the size of a raspberry, which have a fungous core, and of which one is commonly larger than the others; they are accompanied by a slight but contagious fever, and occur only once in a lifetime. The history and description which Willan and Bateman give of this disease consist merely of a compilation from the statements of those physicians and travellers‡ who had been in a position to observe the disease where it was rife; chiefly in Guinea and the African maritime countries, and also in the West Indies. The disease was described by them under the names, mentioned before, of Yaws (African for raspberry) and Pian (for mulberry). Dr. Winterbottom and Dr. Schilling are especially quoted, as their reports§ are the more detailed. According to them, the yaws appear as red, fungous, granular excrescences of the size and of the appearance of a small raspberry or of that of a large mulberry (hence the corresponding designation) on the face, the flexures of the joints, and on the genitals. They secrete a sticky, offensive pus, which dries up into crusts. They are very painful on pressure (on the sole of the foot), and disappear in from a few months to three years. They attack the same individual only once in a lifetime. In the acme of the eruption, several tubercles usually become confluent, forming a large ulcer; the so-called “Mamma-Pian,” which is mentioned by almost all authors. Frambœsia “can be communicated by using the same spoon, by kissing, and by

* Schilling, ‘De Morbo in Europa pene ignoto, quem Americani vocant Yaws,’ 1770. Nielen, ‘On the American Pock or Yaws.’

† ‘Prakt. Darstellung der Handkr.’ v. Bateman nach Willan (Blasius). Leipzig, 1841, p. 408.

‡ Pat. Labat, Dr. Winterbottom, John Hume, Schilling, Bancroft, Thompson, Hilary, and others.

§ Dr. Winterbottom, ‘Account of the Nat. Africans of Sierra Leone,’ vol. ii., chap. 28; and Schilling, ‘Diatribes de Morbo in Europa pene ignoto,’ Ultraj., 1778. (Schlegel, ‘Thesaur. pathol. therap.’ vol. ii., pp. 1, 217.)

coitus, if the genitals are the seat of the eruption, in which case they are often mistaken for syphilis." It is mentioned, further, that mercurials appear to be of less use in the disease than sarsaparilla. Notwithstanding that all the authors quoted asserted the contagiousness of frambæsia, and notwithstanding many other corresponding symptoms, Willan and Bateman, following the lead of their authorities, still considered the disease to be quite specially endemic in the countries mentioned, and that it ought not to be confounded with syphilis.

If Willan and Bateman, owing, undoubtedly, to a want of personal observation, cannot be said, in their chapter on Frambæsia, to have thrown any light on the subject; yet, on the other hand, Alibert has introduced considerable confusion. In the first place, in direct opposition to his predecessors, he attributes frambæsia to syphilis. His second genus of syphilis, Mykosis* (*Beerschwamm*), he divides into—1, Mykosis frambosioides; 2, Mykosis fungoides; and 3, Mykosis syphiloides. From the more detailed account of these three kinds of Mykosis, we gather that Alibert describes, under the term Mykosis, partly, affections which are manifestly not syphilitic, such as the tumours described as M. fungoides and delineated in his Atlas† (plate 36), which we, in common with many other authors, regard as Molluscum (Bateman); and, moreover, that even his Mykosis frambosioides can only be very distantly compared with the forms of disease which were described by the earlier authors as endemic in Africa and the Antilles; the forms of pian, yaws, gattao of the negro, &c. The single instance observed by Alibert of Mykosis frambosioides, in the case of the patient Bartos, a Hungarian deserter, which is described, in the first of Alibert's systems, under the name of Pian ruboide, at p. 161, and figured in pl. 35, may be considered as Syphilis cutanea, ulcerosa et vegetans; especially if we bear in mind the ulceration of the throat which is there mentioned, and the other symptoms present. We, as well as others, have seen similar cases, but we did not therefore think that we had to deal with an exotic disease.

Nearly all the subsequent French, English, and German dermatologists have depended on Alibert or Bateman for their

* 'Monographie des dermatoses, deutsch v. Bloest.' Leipzig, 1837, p. 294.

† 'Description des maladies de la peau.' Paris, 1814, pl. 36.

facts in regard to fromboesia.* Some mention this disease with great reserve (Gibert), or they adopt a particular synonym for it (Fuchst), or they avoid it altogether—Rayer, for instance. The latter uses Alibert's representation of *Mykosis frambosioides* in order to reproduce it in his Atlas,‡ on pl. viii., fig. 4, as *Sycosis capillitii*. All these authors have, in general, either accepted the originality of frambœsia, as a quite peculiar, endemic, morbid process, after Bateman, Plenck, and Sauvages, because they received the descriptions of Dr. Winterbottom, Thompson, &c., in good faith; or, they were inclined, partly, to regard frambœsia as representing a peculiar form of syphilis, perhaps modified by climate and race (the negro of Africa and of the two Indies). The latter view is founded on Alibert's classification, which simply ranks frambœsia among the forms of syphilis, though we have never been able to find out what his *Mykosis* (=Syphilis) *frambosioides* signified in contradistinction to *Mykosis syphiloides*. This conception of the syphilitic nature of frambœsia became more widely extended and received more support, inasmuch as in the course of years many other diseases which had been described as special, endemic forms of ulcerative and destructive processes, had proved to be evidently forms of syphilis; such as the Sivvens or Sibbens in Scotland,§ the *Morbus dithmarsicus*, the *scherlievo*,|| *falcadine*, &c. So far as we know, no original work has appeared since those early communications (reproduced in detail by Sauvages, Plenck, Bateman, and Alibert); of the often quoted travellers and physicians, Schilling, Winterbottom, &c., in which pian, yaws, and gattao have been treated of in a corresponding manner.

On the foundation of Alibert's and Fuch's conception, and in analogy with what has been found to be the case in Sibbens and the other, similar endemic forms of disease, it would appear,

* Hirsch, 'Handb. d. hist. geogr. Path.,' 1 B., p. 379 et sequ. Erlangen, 1860.

† 'Syphilomykes Morus,' C. H. Fuchs, 'die krankhaften Veränderungen der Haut und ihrer Anhänge.' Göttingen, 1840, p. 810.

‡ 'Traité des maladies de la peau,' par P. Rayer. Paris, 1835.

§ Behrend's 'Syphilidologie,' in several places.

|| See, among others, Pernhofer, 'Untersuchungen und Erfahrungen über das Skerljevo.' Wien, 1868.

therefore, not unjustifiable to consider pian, yaws, verruga (Peru), synonyms for frambœsia, to be syphilis.

It could not, however, escape the attention of physicians that, occasionally, excrescences resembling those of frambœsia (raspberry- or strawberry-like, weeping, ulcerating, red, papillary and having fungoid granulations on the surface) are seen on the skin, and may persist for months and years, under circumstances which contra-indicate the diagnosis of syphilis. Fuchs, indeed, found himself compelled, besides his *Syphilomykes morus*, which was equivalent to frambœsia, to distinguish a second non-syphilitic form, *Frambœsia scrophulosa*,* which is equivalent to *Lupus exulcerans* and *hypertrophicus* of authors. And Hebra, for a long time, has used the name *Frambœsia* for all warty, tuberculated, papillary, exuberant growths which appear on chronic ulcers of the leg, on *Lupus exulcerans* and *hypertrophicus*, *serpiginosus*, on scrofulous ulcers, syphilitic, serpiginous infiltrations, &c., and, in this way, does not really recognise frambœsia as a disease *sui generis* at all. Virchow† has classified frambœsia with the endemic forms of syphilis already repeatedly mentioned (*Skérljevo*, *Morbus Dithmarsicus*, &c.), without, however, expressing any positive opinion on the subject. It is particularly noteworthy, moreover, that, lately, peculiar papillary tumours, like those of frambœsia, have been noted by several observers, who have emphatically insisted on their non-syphilitic character. We allude, in the first place, to Köbner, who records two such cases which came under his own observation.‡ He had seen both patients in Hardy's practice at Paris. There are also several analogous cases described by Bazin.§ Some years previously, Virchow had recorded a case, which he saw in conjunction with Dr. Wegscheider, of so-called, general, mulberry-like exuberant growth of the skin,|| and in the same category may be placed the case recorded by Dr. L. Meyer in the year 1869.¶ Virchow is of opinion, in reference to the latter,

* Loc. cit., p. 554.

† Virchow, 'Geschwülste,' 2 B., p. 538.

‡ 'Ueber beerschwammähnliche multiple Papillargeschwülste der Haut,' in 'Klinische und exper. Mittheilungen.' Erlangen, 1864, p. 37.

§ 'Leçons sur les affections cutanées,' &c. Paris, 1862, p. 373 et sequ., and 'Gaz. des Hôpitaux,' 27 mai, 1867.

|| 'Geschwülste,' 2 B., 538, note.

¶ Virchow's Archiv, Februarheft, 1869, pp. 113-115.

that the frambosoid formations on a child would be better referred to the angiomata, although Virchow found the blood-vessels but slightly developed in this case. Köbner, from the results of the examination of one of the tumours which he had obtained from one of the two cases observed by him in the practice of Hardy, came to the conclusion that the new growth ought to be referred to the granulation-tumours, and Virchow (loc. cit.) appears to be of the same opinion. I have myself reported four cases in the 'Archiv für Dermatologie und Syphilis' (loc. cit., p. 390 et sequ), in which characteristically bright-red, papillary, weeping, partially ulcerating excrescences, which bled easily, existed on the scalp. By the characters, described in detail, of the clinical appearances, and of the results of microscopic examination (loc. cit., Taf. iii., figs. 1, 2, and 3), I have established the fact that this rare and peculiar form of disease consists in a chronic inflammation of the corium, in consequence of which a free production of connective tissue, and of blood-vessels and papillary outgrowths from the skin ensues. We have therefore designated this form *Dermatitis papillomatosa capillitii*. I have there, also, clearly shown that the characters of these formations, resembling those of frambæsia, are not identical with those forms of sycosis of the hairy scalp described by Celsus,* Paulus Ægineta,† Galen,‡ Gorraeus,§ Mercurialis,|| Lorry,¶ Willan,** nor, indeed, with sycosis, but represent a true, non-syphilitic, connective-tissue growth resembling frambæsia. Since that time, I have had the opportunity of observing three new cases, precisely similar to the condition described (under sec. 1) in the Archiv f. D. u. S., which have served to strengthen my conviction as to the genuine, inflammatory and non-syphilitic nature of the morbid process.

From the foregoing clinical and historical exposition, it will be clear that under the name Frambæsia, cases have been described, on the one hand, which were probably and demon-

* 'De med. libr. Octo.' Lausannæ, 1772, Lib. vi., c. 3.

† Lugduni, 1551, Lib. iii., c. 3, p. 113.

‡ De comp. med. sec. loc., Lib. v. Argentorati, 1604.

§ Def. med., libr. xxiv., Francof. ad M., 1578, p. 438.

|| 'De morb. cut.' Venetii, 1601, p. 58.

¶ 'Tract de morb. cut.' Parisiis, 1777, p. 432 et sequ.

** Delineations London, 1817, plate lxvi.

strably syphilides (Alibert, Fuchs) and, on the other hand, there have been included non-syphilitic, papillary outgrowths of nodules, tubercles, and papillary excrescences (Fuchs, Hebra, Köbner, Kaposi), all of which resemble one another, inasmuch as they have a papillary appearance, and form reddish, spongy excrescences, with lobulated granulations disintegrating on the surface, weeping and but seldom ulcerating. For such heterogeneous processes as syphilis, lupus, sycosis, dermatitis, caro luxurians, &c., a common designation is scientifically and practically inadmissible. It appears, therefore, advisable to exclude the name Frambæsia altogether from the terminology of skin diseases, to eliminate the cases of syphilis, and in order to indicate the occurrence of papillary excrescences resembling those of frambæsia, to add the term Papillare, or Papillomatosum, to the name of the fundamental, essential disease, and to retain the name Papilloma, to express the occurrence of substantive instances of such an affection.

Treatment.—The treatment of the frambæsia-like, vascular vegetations may generally be considered without reference to the genesis or locality of these luxuriant growths. Whether they appear in circumscribed areas in sycosis or in syphilis, or on ulcers of the leg, or as spontaneous formations, for example, on the back of the head, the problem will always be how to destroy them, and rid the patients of these disfiguring, suppurating, frequently bleeding, offensive, occasionally also painful—in short, very troublesome formations. In the first place, the morbid products lying on the growths, pus-, and blood-crusts must be removed. This is accomplished by applying emollient plasters to the crusts, oily and greasy applications. When the red, papillary excrescences are fully exposed, we proceed to remove them in any way which may be adapted to the circumstances of the case. When practicable, we cut them all off at one sitting, or in batches, by means of a scalpel or of scissors, as close as possible to the base, and, if possible, at the level of the surrounding healthy skin. The bleeding is, as a rule, very considerable. The blood wells up from numerous points copiously, as if from a well-filled sponge. Charpie, dipped in a solution of (per-) chloride of iron, is then laid on the cut surface. By this means, the bleeding is checked and a great number of blood-vessels obliterated. Some portions of the

luxuriant mass necrose and disappear during suppuration; others atrophy and shrink. We can attain the same end, from the commencement or in the course of the treatment, by the application of various other remedies, which will either directly destroy the vegetations, cauterise them or dry them up, or make them shrivel up. In this way will act repeated cauterisation with caustic potash in substance, concentrated solution of potash, acetic acid, acetic acid in combination with milk of sulphur as a paste, hydrochloric acid, alone or with calomel as a paste, acetate of lead, alum, solution of corrosive sublimate, tincture of thuja (or thuya), sabina, &c. Mercurial plaster is often of very great service, since it softens the thick excrescences and flattens them.

As these framboesia-like outgrowths are, as a rule, very obstinate, or very extensive, it will usually be necessary to try many of the remedies mentioned, and similar means, in succession and alternately. If certain other diseases are recognised as lying at the foundation of the framboesia-like excrescences, such, for example, as lupus, syccosis, syphilitic tubercles, &c., these latter must be treated according to their several requirements.

CHAPTER XLI.

(CLASS VII.)

ATROPHIÆ CUTANÆÆ.

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1. *Atrophy of the Pigment, Achromatia, Leucopathia.*

By atrophy of the pigment of the skin we imply the disappearance of the normal yellowish- (blond-) brown, deep-brown, or black colour, which is peculiar to the horny structures of the general integument, that is, to the mucous layer and to the hairs. These structures, when affected with pigmentary atrophy, appear of a white, yellowish-white, or greyish colour. The atrophy of the pigment may affect either the epidermis itself, in which case the hairs will, also, as a rule, be without pigment; or the hairs, alone, may lose their pigment, whilst the skin remains normally pigmented.

A. ATROPHY OF THE PIGMENT OF THE EPIDERMIS, LEUCODERMA.

Definition.—By the general term Leucoderma, we shall indicate the condition in which the skin, owing to absence of the pigment, normally present, appears of a white colour. This condition may be congenital or acquired, diffused over the whole body, or confined to certain portions of the skin.

History.—It will easily be conceived that such a remarkable condition of the skin as that which is produced by an absence of the pigment could not escape the notice of the older physicians. The variety of notions and names which became current among them in regard to this condition, however, gave rise to

a confusion of ideas, which has continued, in some degree, to a recent date.

We find as designations for the absence of pigment from the skin, Vitiligo, Vitiligo alphas and Vitiligo leuke (Celsus), Leukasmus, Leukosis, Albinismus (Rayer), Albor cutis (Plenk), Leukæthiopia, Achroma (Alibert); Macula alba, albida; Morphœa; Alphodermie; Epichrosis alphas and Epichrosis pœcilia (Mason Good); Leukasmus figuratus and universalis (Wilson), &c. An indiscriminate use of all these and similar designations for the absence of pigment in the skin is not advisable; for this reason, that the want of pigment at one time represents a substantive anomaly of formation, or a morbus *sui generis* and a wholly insignificant condition (Vitiligo alba levior, Celsus), and, at another time, forms a part of the phenomena of a very intense, constitutional disease, namely, Elephantiasis Græcorum (Vitiligo alba gravior, Celsus).

We will, however, here, be content with a mere allusion to the important relation of the nomenclature to the conception of the disease, and not enter further into an historical exposition of the same, because in the chapter on Lepra we must do so for essential reasons. And, therefore, we may be allowed, without assigning any more detailed reasons, to accept, for the clinical appearances we are about to describe, those designations which seem to us best adapted according to their historical value.

The absence of cutaneous pigment is either congenital—Leucoderma congeniale; or is acquired in the course of later life—Leucoderma acquisitum.

1. *Congenital absence of Pigment, Leucoderma congeniale, Albinismus.*

The name Albinismus is applied popularly to this condition. The individuals affected are called Albinos, Kakerlaken, Dondos.

The albinismus is either diffused over the whole body (A. universalis), or confined to certain parts (A. partialis).

a. General albinismus means a congenital absence of pigment over the whole body. The individuals affected have a dull-white, somewhat pinkish, velvet-like, fine skin. The hairs of the head are of a glistening white, or clear, yellowish-white, or

almost snow-white colour and silky. The lanugo-hairs on the body are very fine and are also without pigment. The iris is of a pinkish-red colour, because it has no pigment and its blood-vessels, therefore, become visible. The pupil is also red, because the dark pigment of the choroid is wanting and the rays of light, which are usually absorbed by it, are reflected outwards. The albinism remains unchanged throughout the whole of life. As a rule, the subjects of the affection are of delicate constitution.

The *cause* of albinismus has not been made out. It is observed more frequently in negroes (nègres blancs) than in members of the white races, but it is sufficiently common among the latter. It is well known that parents who possess thoroughly good constitutions and a normal amount of pigment may give birth to albinos; but it is less certain whether albinos, when capable of having children, also beget a normally pigmented offspring.

The anatomical examination of the skin of an albino, which was undertaken by Ruzzi, in the year 1793, in the Hospital at Milan,* has proved the total want of pigment. Fuchst† is of opinion that, probably, the vascular network of the cutis may also be less developed in albinos than is normally the case.

b. *Albinismus partialis*.—In negroes, from the time of birth, scattered, circumscribed, pigmentless patches may exist. Such negroes, on account of their parti-coloured appearance, are called nègres pies, nègres monchetés, elster-neger, pied negro Eng. These white patches remain unchanged throughout life. According to some authors, they may even, occasionally, become larger later in life. These circumscribed, congenital, pigmentless spots form, to some extent, the reverse of the congenital pigmented spots in white persons (Nævus pigmentosus). The latter brown spots, also, as a rule, remain unaltered throughout life; occasionally, however, they may increase in size to a certain extent. Though all authors assert that these partial losses of pigment occur, as congenital defects, in negroes only, we believe that we have often seen such in white persons.

* Alibert, 'Krankheiten der Haut.' Leipzig, 1837. Uebers, Bloesat, p. 471, ii. B.

† Loc. cit., p. 20.

2. *Acquired deficiency of Pigment, Leucoderma Acquisitum.*

a. *Idiopathic form, Vitiligo.*

Definition.—We understand by the term Vitiligo that peculiar disease of the skin in which round, oval, sharply defined white (pigmentless), not scaly (smooth) patches develop on the skin, and steadily increase in size, whilst their borders appear surrounded by even abnormally dark pigment.

History.—The name Vitiligo was first used by Celsus (Lib. v., cap. xxviii., 19 (Lausannæ, 1772, p. 359), who distinguishes three kinds, alphos, melas, and leuke. "*Vitiligo quoque, quamvis per se nullum periculum adfert, tamen et fœda est, et ex malo corporis habitu fit. Ejus tres species sunt. ἄλφος vocatur, ubi color albus est, fere subasper et non continuus, ut quædam guttæ dispersæ esse videantur. Interdum etiam latius et cum quibusdam intermissionibus serpit. Μέλας colore ab hoc differt, quia niger est et umbræ similis, cætera eadem sunt. Λεύκη habet quiddam simile alphi, sed magis albida est, et altius descendit; in eaque albi pili sunt, et lanugini similes.*"

Whilst the foregoing description of Vitiligo alphos et leuke will apply very well, as we shall see, to pigmentless patches on the skin, and melas, to Nævus pigmentosus, the succeeding lines are not so easily understood:—"Omnia hæc serpunt; sed in aliis celerius, in aliis tardius. Alphos et melas in quibusdam variis temporibus oriuntur et desinunt. Leuce quem occupavit non facile dimittit."

According to the latter expressions, we might consider vitiligo to mean Psoriasis or Eczema (fere subasper), or Elephantiasis Græcorum. In fact, these words have led to the great confusion which has existed even up to the present time among dermatologists as to this matter. On the other hand, the eminent commentator, Johannes Gorraeus (Definit. medic., l. xxiv., Francof. ad Mœnum, 1578, p. 25) gives the following exact definition:—"Ἀλφός, vitiligo, est vitiosa macula et fœda in corporis cute apparens, et ex malo corporis habitu excitata, sed sine manifesta cutis asperitate, sine squamis, sine exulceratione. His enim notis a psora, lichene et lepra, cæterisque hujus generis tumoribus distinguitur. Dicitur ex eo quod colorem cutis immutet; immutare enim apud veteres ἀλφάλλειν dicebatur."

This definition is so distinct, that it must cause some surprise how Willan and Bateman could describe ('Prakt. Darstellung der Hautkrankheiten,' &c., Halle, 1815, p. 397), under the name of Vitiligo, white tubercles appearing and disappearing within a few days; or how figures 2 and 3, in plate lx. of Willan's Atlas (Delineations of Skin Diseases), should correspond to vitiligo. And those authors are not at all more justified who, in spite of this definition, even at the present time, associate alphas and leuke with Elephantiasis Græcorum without in this way arriving at any clearer view of the matter.

Most writers, however, have not been able to ignore entirely the original meaning of the term Vitiligo as indicating a want of pigment, and make use of the expression to designate partial Achroma. Thus we find Achroma vitiligo (Ephélide scorbutique), Alibert,* &c.

Symptoms, Mode of Development, Progress.

Vitiligo occurs in the form of detached, circular, well-defined spots on the skin which are remarkable for their white colour (absence of pigment). Their surface is perfectly smooth, not elevated above the level of the surrounding parts nor depressed; pale, smooth, not scaly. The spots are surrounded by abnormally dark pigment, which gradually shades off into the normal pigmentation of the surrounding parts. The skin of the white spots feels just like that of the healthy adjacent parts. It does not show any departure from the state of the normal skin, either as regards firmness, thickness, structure, temperature, sensitiveness, or its secreting functions (sebaceous and perspiratory secretions). If hairs exist on the parts which are deprived of colour, they are either normally pigmented, or, as is very often the case, they, also, are without pigment, of a grey or glistening white colour, but they are firmly adherent to their follicles.

So long as the white spots of vitiligo are of small size, that of a fourpenny-piece or of a half-crown, they are circular in form. In the course of months and years they increase in size, and in the same degree they become more oval in form. The periphery, however, during this enlargement, always remains surrounded by a streak of very dark pigment, as if set in a

* Atlas, plate 27.

frame. The impression produced by the appearance of the patches is, that the pigment has been uniformly carried away from the centre of the white patch and deposited at the circumference. From this mode of increase of the white spots, it follows that their configuration is the reverse of ("compensated by") that of the surrounding, dark-brown, pigmented part. The white spots, for instance, always have a convex border, they are discoid, whilst the surrounding, brown parts present a concave margin towards the vitiligo spots. This distinction is striking when the white spots have developed more extensively. When, for instance, two or more white spots have become confluent and form a large patch of an irregular shape, this will have convex borders everywhere, and will contrast with the brown spots with concave borders.

This circumstance allows of the mode of development of the process being clearly recognised in the most advanced stages. So long as the pigmentless patches are of the size of a half-crown or of the palm of the hand, and are isolated from one another, they are situated in the midst of the large extent of the surrounding dark and normally pigmented skin. It is easily recognised that the white patches represent the originally diseased parts, and that the brown consist of healthy skin. If, however, after the lapse of months or of years, very extensive, white patches have been formed by confluence, then they surpass the brown patches in extent, and the latter become the more striking and may easily be mistaken for the diseased parts. The concavity of the borders of the brown spots, and the convexity of those of the white spots show, even in this advanced stage, whence the pigmentary anomaly has proceeded; that the white spots are spreading in a circular manner, with a convex border, and that the brown spots are becoming eaten away in the same direction, and, consequently, have concave borders.

Lastly, in the course of years, the pigmentless patches may occupy whole regions of the body, or even the whole surface of the body, when, of course, the contrast of colour, that is, the disfigurement, disappears. We have not, ourselves, actually seen the whole of the skin thus deprived of its pigment in toto; but we have seen individuals in whom the loss of colour was spread over very extensive tracts of the body.

NOTE.—On the 20th of August of the present year, a man, aged 56, presented himself, as an out-patient, who exhibited a most extensive whitening of the skin in consequence of vitiligo. Brown pigment could only be detected on the most peripheral parts of the body; on the dorsal surfaces of the feet and hands, here and there, on the backs of the fingers, in the region of the elbows and on the face. Here, brown and white patches still alternated with one another. Corresponding to the latter the hairs of the beard were grey, the head was almost completely bald and pigmentless, and so, also, was the rest of the body. This case showed clearly that in the course of years the disease may lead to an almost complete whitening of the whole skin.

As a rule, the patients, in the first place, observe only a white spot of moderate size on some one part of the body. After a time, it may be weeks, several similar spots appear in different localities. Very often these patches commence in the immediate vicinity of a pigment-mole (*nævus*), or of a brown, flat, acquired wart. Just as frequently, however, they appear in the pubic region, on the forehead, on the back of the hand, on the hairy scalp, &c., and spread thence steadily circumferentially. The patients appear as if speckled with brown and white—piebald. The phenomenon is most striking on the uncovered parts of the body, and also on the hairy parts. The skin of the face looks as if it had been painted piebald, so does that of the hands; on the fingers, brown and white rings alternate. The pubic hairs and the hairs of the scalp are quite white, in isolated tufts and curls, *Poliosis circumscripta* (Fuchs), whilst the surrounding hairs, for instance, are of a normally dark colour. If we separate the white hairs from one another, we then discover that the portion of skin corresponding to the group of the latter is white over a patch of a circular form—is without pigment.

There is not the slightest abnormality to be detected, subjectively, in the whitened patches of skin, or in the state of the patient's health; at the beginning, or in the whole course of the vitiligo. The individuals affected enjoy a thoroughly good state of health.

Prognosis.—The increase in the numbers and the peripheral enlargement of the separate vitiligo spots proceed steadily in the course of years, without the whole surface of the skin being necessarily affected by the loss of colour, even to the end of life. One or other of the patches, or even the whole process, may temporarily remain stationary, or, having reached a certain

stage, may visibly become entirely checked. A few, both patients and physicians, have noticed that a white patch may even become again normally pigmented. We think that in connexion with the latter point a faulty observation may, perhaps, have occurred; at least, we have never been able to satisfy ourselves that such a restitution of the pigment has taken place. We must therefore say that the process is incurable.

The sole unpleasant consequence for the patient is the striking deformity which is produced by the piebald appearance. The patient never experiences any further unpleasantness from the affection.

Etiology.—As the process itself is obscure, so also the causes of vitiligo are unknown to us. There is no general pre-disposing influence of the disease known, and only certain local ones suspected. In reference to the latter, we have already pointed out that not unfrequently the first whitening commences close to a previously existing pigment-mole—a circumstance to which Hebra was the first to call attention. It would also appear that, occasionally, pressure, or local irritation, and local organic changes in the skin, may induce a whitening of the latter. Thus, Lecat, according to the statement of Fuchs (loc. cit.), once saw the malady develop in a negro after a burn. The parts which were burnt became white first, and then the process spread over the whole body. Hamilton (Alibert, loc. cit.), reports a similar occurrence in a negro, in whom, after a surgical operation had been performed, white spots appeared, in the first place at the locality of the operation, and, later, on other parts of the body, till, finally, the whole of the body became white. In the greater number of the cases, however, we must fall back on the suggestion of a disturbance of innervation, a bad cloak for our ignorance, as a cause of vitiligo.* This will not explain, even when there is a local pre-disposing cause for the whitening present, such as a Nævus pigmentosus, how primary foci for the loss of colour should arise in isolated localities at a distance. Certain authors have also stated that general “nervous weakness,”

* Thus Beigel, in ‘Albinismus and Nigrismus’ (Virchow’s Archiv, Bd. xliii., 14 Heft, 1868). What Beigel adduces in addition (loc. cit.) as a cause of the disappearance of the pigment, seems to the point—objective. Beigel mentions, also, in the same place, an anomaly of the colour of the skin to which he ascribes the name *semi-Albinismus*.

in consequence of preceding exhausting diseases, such as typhus or intermittent, may give rise to vitiligo. Some patients even trace their vitiligo to the stage of convalescence after one of the constitutional diseases mentioned. No special elucidation is afforded by these statements; on the contrary, it would rather appear as if we attempted *obscura obscurioribus dilucidare*. In reference to the various races of men, it would appear that vitiligo (*Leucopathia acquisita*) occurs* more frequently among negroes, and, therefore, in the tropics, than among white people and in our zone. It is evident that the disease will be more striking when it occurs in negroes than when it occurs amongst white people, on account of the greater contrast of colour. Perhaps this circumstance may be the sole foundation for the idea of its greater frequency in the dark races, because in these, laymen (travellers, Hamilton) can easily observe the change of colour, and, besides, the natives go about almost naked. It is certain that vitiligo occurs not unfrequently among white people. Every year we have the opportunity of seeing at least six cases of this malady amongst 3,000 who are examined when stripped, that is, 2 per 1,000 new cases, *i.e.*, in individuals who present themselves for the first time with this disease. It would seem that the disease commences in middle life only. We have never seen it in children,† and only in old people when it had already attained to a considerable degree of development.‡ As a rule, those who are affected with vitiligo are thoroughly well nourished, or, at any rate, they do not show any kind of cachexia.

Diagnosis.—With a due regard to the characters of the vitiligo

* See, among others, the cases by Dr. Theodor Simon in 'Ueber Albinismus partialis,' *Deutsche Klinik*, 1861, Nos. 41 and 42.

† Plate x., New Syd. Soc. Atlas, is a portrait of a boy, aged 12, who presented a striking example of this disease. It had begun eight years previously. He was under the care of Mr. Hutchinson. (*Catalogue*, p. 35, *Lond. Hosp. Rep.*, vol. i., p. 7.)—Tr.

‡ It is well known that Vitiligo may appear, also, in the lower animals. It arises after early life, spreads from isolated centres, and steadily progresses in a peripheral direction, and is characterised by a whitening of the skin and of the hairs. Some years ago a horse of an excellent breed, belonging to the Royal Stud here, became unsuited for use as one of a set, owing to such an "acquired" piebald appearance. In this animal, the spots were of exactly the same character as is met with in men, and were very striking, because the hairs corresponding to them turned grey.

spots, which have been detailed, their clinical symptoms, their development and their progress, there ought to be no difficulty in recognising the disease, nor will there be any liability to confusion with other affections. Yet, not unfrequently, such a confusion does occur nevertheless; that is, with Elephantiasis Græcorum (Lepra, leprosy). The reason for this lies in the fact that whitening of the skin is also met with in Elephantiasis Græcorum as one of the symptoms. It occurs in two forms. At one time, as white spots, which alternate with adjacent dark-brown portions of skin. These spots are usually of irregular shape, not sharply defined; they are not of a dull-white colour, but are generally silvery grey and glistening (Viteligo alba gravior, Celsus), and the affected skin is also usually altered in structure; it is thickened, and frequently also anæsthetic. At another time, the white spots may certainly be roundish, and tolerably sharply defined, but the whitened skin is altered in structure still more intensely than in the other form. It is often uniformly atrophied and depressed beneath the level of the adjacent portion; it is also, frequently, anæsthetic, or it is atrophied in a punctiform manner, as if scars like those resulting from pregnancy were scattered over it, and it is occasionally surrounded by a violet-red, somewhat elevated border, on which the skin is hyperæsthetic. Of this latter form of Elephantiasis Græcorum, which has been very aptly described by Daniellsen and Boeck, and sketched by Loring, we have only latterly had the opportunity of observing two cases. We will discuss them more fully in the chapter devoted to the subject. This is the form which Erasmus Wilson* has, of late years, repeatedly referred to as *Morphœa alba*, *Viteligo candida*. The symptoms above noted as characteristic of the white spots peculiar to leprosy, when taken in conjunction with the peculiarities of the spots of vitiligo, which are always present, and which have been also enumerated already, will always enable anyone to distinguish between them.

Anatomy.—Gustav Simon examined some white portions of the skin removed from the body of a woman who had suffered from vitiligo, and who died in the Charité Hospital. He could find no other abnormality than an absence of pigment. In the

* 'On Diseases of the Skin,' London, 1867, p. 674, and in various places in the 'Journal of Cutaneous Medicine.'

brown patches adjacent to the white ones, however, he found a considerable quantity of dark pigment-granules in the cells of the rete malpighii ('Hautkrankheiten,' Berlin, 1851, p. 63). I have never had the opportunity of examining a white portion of skin affected with vitiligo anatomically. This is easily accounted for by the infrequency of the disease and the absence of any ill effect on the general well-being of the patient. I have, however, examined richly pigmented portions of skin, and especially, also, the skin of negroes. If we examine carefully a section of a normal piece of skin from a negro, we find* the dark, brownish-yellow or brownish-red pigment which gives the skin its peculiar colour accumulated in the cells of the second and third layers of the rete mucosum lying immediately over the papillæ.

We must not in any way conclude from this observation that the loss of pigment from places in which it was formerly present has been produced by a change in the pigment itself, or by an organic change in the cells of the mucous layer which contain the pigment-granules. No actual support is afforded by experience, in fact, in favour of the supposition that there is an independent involution of, or even change in, the pigment-granules. It is merely known that the blood-pigment (hæmatin, hæmatoidin), under the influence of certain chemical re-agents, partly grows clearer, of a light yellow colour, and partly becomes dissolved (Wedl, Kölliker, Virchow). As far as the influence of an organic change in the cells of the rete on the pigment is concerned, we can merely say, that according to the observations which have been made, it would appear to be entirely of a negative character. If we, for instance, try in what way we can artificially bring about the removal of pigment which is present in the skin, we shall find that we can only accomplish it by the removal of the epidermis itself containing the pigment. When this is lifted up throughout its whole thickness by an artificially excited exudative process, by blistering, for instance; or is removed even to its deepest layers by mortification, by means of tar, or soft-soap, for instance, those cells of the deepest layers of the rete are also removed which contain the pigment. By these procedures, however, the pigment will only be removed

* See Kaposi (Moriz Kohn), 'Ueber eine eigenthümliche Hautgeschwulst der Neger,' Wiener med. Wochenschrift, 1869, No. 1.

for a time, in conjunction with the epidermic cells containing it. Moreover, a constant shedding of the epidermis occurs as a physiological condition. And if, according to a rather plausible theory, the first layer of cells of the rete mucosum, those which rest, pallisade fashion, on the papillæ, and, perhaps, project into the latter by filiform processes, are regarded as more permanent structures;* yet, this view will not hold good for the cells of the higher layers, and, therefore, not for those which contain the pigment. These undoubtedly share in the constant physiological processes of shedding and renovation. The permanence of the normal pigmentation of the skin can only be maintained by the formation of new cells containing pigment in the place of those which have been shed. There can be no doubt that the material for such a renovation, and, according to the researches of Biesiadecki,† Pagenstecher,‡ and others, possibly, also, for the formation of the epidermis itself, is derived from the vessels of the papillæ. And, in this way, the ultimate source of the pigment itself can only lie in the blood of the vessels of the papillæ.

If, therefore, spontaneous whitening of the skin occur, and vitiligo become developed, the formation of the epidermis must be so far abnormal that this, when produced from the papillæ, already contains no pigment, or that no pigment is carried from the papillæ to the epidermic cells arising within the layers of the rete mucosum. Whether the one or the other of these processes, or whether both of them together correspond to the actual condition, it must invariably be explained as a disturbance of nutrition in a portion of the epidermic structure, the ultimate cause of which is some abnormality of innervation (Trophoneurosis). Even if we adopt this view, however, which is supported by the therapeutical and physiologico-histological data mentioned, yet not only does the original cause of the cessation of the transference of pigment remain still unexplained, but, also, there is no reason suggested why the atrophy of the pigment

* Kaposi (Moriz Kohn), 'Archiv f. Dermatologie und Syphilis,' 1869, 3 Heft, p. 413.

† Beiträge zur phys. und path. Anatomie der Haut,' Sitzungsab. d. k. k. Ak. d. W. Ivi. B., Junih. 1867.

‡ 'Ueber die Entwicklung der Epithelialzellen,' Sitzungsab. d. k. Ak. d. W. Ivi., Aprilh. 1868.

commences at widely separated parts of the body, and why it steadily spreads from these foci in a circular manner.

Treatment.—We are not able to cure *Vitiligo* by any of the remedies or methods of treatment which are at present at our disposal. We can neither prevent the production of fresh pigmentless patches, nor arrest the progress of those already formed, nor permanently reproduce the normal pigmentation of the skin artificially on the whitened parts. Not only are all the known internal, the so-called “alterative” remedies, including arsenic, of no effect in this respect, but, also, all the local methods of treatment which have been tried, and which are used in cutaneous therapeutics. However, a plan of treatment of an opposite character may be adopted, by which a partial improvement of the condition produced by vitiligo may be attained. The disease, as has been before mentioned, is chiefly troublesome, inasmuch as it causes the parts of the skin which are uncovered by the clothes, for instance, that of the face and of the fingers, to appear speckled white and brown. If the affected parts could be made of a uniform colour, the deformity would be removed. The paler (white) portions of skin can, indeed, be temporarily tinged of a brown colour by the application of vesicants. But, after about fourteen days, the newly produced pigment vanishes again, and the patch becomes as white as before. We are also able, however, to deprive the brown patches, adjoining the white ones, of their pigment. By this means the whole surface of the skin becomes uniformly pigmentless and white, and the disfiguring “piebald appearance” vanishes.

For the removal of the pigment from the brown patches in vitiligo, we make use of the remedies and methods which have been already fully detailed by Hebra in the present volume, p. 15 et sequ, to which we must refer our readers, in order to avoid repetition. I will merely just mention here, shortly, that all the remedies act chiefly by causing a rapid removal of the whole of the epidermis, including the deeper layers containing the pigment, and, further, that none of those remedies must be employed in these cases whose application experience teaches us is followed by the production of fresh epidermis, which also appears of a dark colour. These are, more particularly, cantharides, cortex meserei, croton oil, mustard seeds, and sulphuric

acid. On the contrary, the remedies which are suitable for use according to the methods detailed, p. 16, loc. cit., are acetic, hydrochloric, and nitric acids, borate of potash and soda, the caustic alkalis and their carbonates, potash, soda, ammonia, magisterium bismuthi, white precipitate, tincture of iodine, and iodo-glycerine, and, pre-eminently, corrosive sublimate, any of which may be used in various combinations and modes of application, as stated at the place to which reference has been made.

b. Concomitant and consecutive forms of Leucoderma Acquisitum.

These forms of atrophy of pigment do not represent an independent morbid process, like vitiligo, but they in part accompany or form a portion of the character of certain morbid processes in the skin, or they arise consecutively, in consequence of certain local pernicious influences, and certain local organic changes in the cutis. As an *accompanying* phenomenon, we meet with it in the patchy disappearance of pigment in Scleroderma adultorum,* which has been previously described, and in Xeroderma, which will be discussed in a subsequent chapter. In both of these very severe skin diseases, dark brown, pigmented and pigmentless spots occur on the skin, of the size of a lentil, or larger, which are quite irregular in form and mutual arrangement. The pigmentless spots do not, however, agree in their progress with those of vitiligo. They do not spread in a circular manner, but, having once made their appearance, they remain unaltered. On looking at such a speckled skin, we are impressed with the idea that the, usually, uniformly diffused particles of pigment in the skin have become scattered, like the coloured glasses of a kaleidoscope.

Pigment disappears consecutively from portions of skin which are exposed to mechanical pressure. Thus Rayert† states that he has seen portions of skin become whitened which had been subjected to the pressure of a truss for a long time. We ourselves treated a patient who, on account of lupus of the right external ear, had worn a handkerchief tied round the ear, cheek, and chin, and in whom the skin had become white on the part corresponding with the outline of the handkerchief. Under

* Kaposi, p. 111 of this volume, and H. Auspitz, 'Wiener med. Wochenschrift,' 1863, No. 47.

† Loc. cit.

such circumstances, the pigment may be again renewed if the constant pressure be removed, as may be seen, indeed, in the case just mentioned, since he has discontinued the use of the handkerchief, the lupus having been cured.

A loss of pigment also occurs in places where, in consequence of preceding exudation, cell-infiltration, ulceration, injury, or excessive tension and stretching of the skin, a partial or complete atrophy of some or of the whole of the cutaneous papillæ involved has been produced; after the disappearance of syphilitic papules and gummata,* for instance, or of scrofulous and syphilitic ulcers, after the healing of incised or penetrating wounds, of deep excoriations† (such as occur in connexion with *Pediculi vestimentorum*) after anasarca, in the so-called scars of pregnancy (*Lineæ albicantes*), in the atrophic striæ of the skin (*Striæ atrophicæ cutis*), which are so mysterious in their origin, &c., &c. In all these cases, the pigmentless spots are situated at points where the papillæ have been destroyed. At first, the spot is usually surrounded by a pigmented areola, but, finally, after this has disappeared, it becomes uniformly white, as far as the extreme limits of the portion of skin which has been wounded or infiltrated, and the whiteness remains permanently.

It is manifest that nothing can be said with reference to the treatment of the pigmentary atrophy which comes under the category last mentioned.

* Simon also mentions this, loc. cit., p. 64.

† There is a negro now in the Clinique, in whom, at all the places where we can find any trace of excoriations, there is a corresponding striated atrophy of the pigment.

CHAPTER XLII.

(CLASS VII.—DIV. I.—(CONTINUED). .

B. ATROPHY OF THE PIGMENT OF THE HAIR.

*Greyness of the Hair, Canities Poliosis (Fuchs, Frank),
Trichonosis discolor (Wilson).*

IF the human hair, instead of being of one of the usual shades of colour (black, brown, red, blonde), appears of a grey, snow-white or silvery-white colour, we suppose that either relatively or absolutely it is deficient in pigment.

Grey hair may be met with as a congenital anomaly, or it may first become apparent later in life only—an acquired alteration.

Of the *first*, we have already treated when speaking of albinismus. Persons who do not appear to have any pigment in any part of the skin, from the time of birth, have also pigmentless, silvery or silky hairs everywhere. Hair without any colour is also met with, however, as a congenital, partial affection. This may either mean the same as Albinismus partialis adnatus, in which the hairs corresponding to the congenital, pigmentless patches of skin are also white; or, grey hairs may occur only on isolated parts of the body, a tuft of white hairs may be found in the midst of brown hairs, on the scalp, for instance, without the skin corresponding to it having lost its pigment (Poliosis circumscripta, Fuchs). In support of this may be adduced not only narratives of an old date, which will be found in Eble,* but, also, the more positive information of modern date afforded by Kancrow,† Erasmus Wilson‡ and others. The greyness of the hair which comes on later in life—Canities acquisita—is either physiological, as Canities senilis, or it makes

* Loc. cit., vol. ii., p. 314.

† De pilis, pilorumque morbis, dissert. inaugur. Berol. 1834, p. 20.

‡ Loc. cit., edit. 1867, p. 733.

its appearance before the average physiological period for the hair to become grey, and is then called Canities seu poliosis præmatura.

a. *Canities Senilis.*

Late in life the hairs of most persons turn grey. In the first place, as a rule, a few isolated grey hairs appear on the temples. By degrees, several are noticed here and on other parts of the head, until, at length, the whole of the hairs of the head have turned grey. During this time, the hairs of the beard and on the pubes have also been turning grey. Occasionally, the hairs of the beard lose their pigment before those of the scalp. It is generally acknowledged that hairs of a dark-brown colour turn grey earlier than those of a blonde tint.

b. *Canities Præmatura.*

It is not at all an infrequent occurrence for individuals who were born with pigmented hair, of a brown or blonde colour, to lose the colour of their hair—turn grey—even while still young and in full vigour of life, and at a period long prior to the average time for the hair to become grey, physiologically. This, as has been mentioned, not at all infrequently observed phenomenon, is the centre of fact from which has radiated a wide circle of stories, which many authors have amplified till they have become fabulous.

When the hair of children and young persons prematurely turns grey, it is also either a universal affection, so that, for example, the hair of the whole of the scalp or of the beard turns grey, or merely a few tufts of hair in the midst of such as remain of normal colour become affected. This partial whitening of the hair is generally permanent. The skin corresponding to the altered hairs is, however, not deficient in pigment (Simon, loc. cit., p. 380); or, at least, it need not necessarily be so. Precisely as in senile canities, the skin corresponding to the patches does not lose its pigment.

Further, individual hairs may partially lose their pigment here and there; or, what seems to me the more probable, they may be developed without pigment. Thus we may meet with

brown and white "ringed" hairs, such as Karsch,* Simon,† Wilson,‡ and others have observed. To the unassisted eye, these hairs look as if spotted over with black and white (speckled). In the case of Baum-Karsch, which was also seen by Prof. Bencke and Dr. Krieger, Simon found that the separate rings were not of equal length on all the hairs. "They appeared closer together at the middle of the hair, and were wholly wanting at the tip and near the root." As regards the form and development, those cases belong to the same category in which, during a considerable space of time, individual hairs appear alternately pigmentless and pigmented. Richelot§ saw hairs which were grey, for two inches, from the root upwards, in a chlorotic girl, whilst the upper end of the hairs remained pigmented. After the chlorosis was cured by the administration of iron, the hairs grew again as brown as before, so that the girl had hairs which, at the upper and lower portions, were of a brown colour, and which, in the middle, for a space of two inches, were of a white colour. This well-described case affords a clear insight into the genesis of atrophy of the pigment of the hairs, which we will discuss directly.

Premature canities has, as a rule, a permanent existence for the remainder of life. There are, however, a sufficient number of cases mentioned in the various works in which, subsequently, coloured hairs have again appeared after the grey ones had fallen out (Alibert, Rayer, and others).

In reference to the space of time which is required for the hairs to become grey, or within which it may occur, most authors express themselves in a very indefinite or not very convincing manner.

An opinion in relation to this matter can only be properly arrived at in accordance with the conception we may form in regard to the mode of origin of the whitening of the hair itself.

Of the mode of development of the "grey" hairs most authors say nothing at all, because a judgment formed on this point would also be influential for the criticism of various other

* Karsch, 'De capillitii humani coloribus quædam,' Dissert. inaug. Gryphiæ, 1846.

† Simon, loc. cit., p. 382.

‡ Wilson, loc. cit., p. 732, "banded," "ringed," hair.

§ 'Prager Vierteljahrschrift,' 1845, 3 Bd., Analekten, p. 79.

data concerning "the turning grey," and especially concerning the "cause" of the whitening of the hair. A few state, certainly, that in the gradual change of colour in old people the hairs turn grey, first of all, at their distal ends. This would indicate that the pigment of the hair, or the latter itself, undergoes a local change of structure in consequence of which the hair appears grey.

Careful observers, however, Simon and Wilson, for instance, assert that they have undoubtedly seen the hairs brown at their summits and grey at their roots. This statement would tend to show that the hair appears grey solely because no pigment is conveyed to it from the papilla.

Hebra is most decidedly of the latter opinion, for he even declares that the gradual change in the colour of the hair depends on the fact that in the physiological growth of the hair, new hairs, deficient in pigment, grow in the place of the pigmented hairs which have been shed. From this point of view, however, Hebra cannot do otherwise than add the above observation to his own, of which, indeed, it forms a part, that, namely, a hair may also turn grey without being replaced by a new one, because, during its continued growth, no more pigment is supplied to it from the papilla. The hair may, therefore, turn grey from below upwards at the same time that its summit still contains its former pigment.

As a rule, the deficiency of pigment, *i.e.*, the turning grey, proceeds gradually, in such a manner that, at first, one and the same hair, according to its length, is, in one part, normally coloured and in another wholly wanting in pigment; and that, consequently, the conveyance of pigment does not cease at once, but is irregular and incomplete. At the commencement, the coloured and colourless portions of the individual hairs are about equal in extent. It is only after some time that the latter preponderate and then give rise to the impression that the "hairs are turning grey."

When speaking of the mode of production of atrophy of the skin-pigment, I have shown that the pigment has its source in the papillary layer, and that the spots without pigment can only arise because the pigment deposited in the rete mucosum is shed with the cells of the latter as part of the physiological process, whilst no fresh transference of pigment from the papillæ occurs.

A precisely similar anatomico-physiological condition governs the conveyance of pigment into the hair. If the papillæ supply the pigment, the hairs appear pigmented, and if the supply of pigment from the papillæ be interrupted, the hairs which are subsequently formed must be without pigment. In this way is also explained quite satisfactorily the phenomenon of the hairs appearing brown above and grey below when they gradually become grey. We can, however, represent the matter still more clearly. We need not seek far in order to find hairs which are grey at the root and bulb, clearly of a greyish-brown higher up, and which are, finally, but always with a gradual transition, of a normal brown tint at their summits.

The hairs, therefore, turn grey "gradually," not only in the sense that by degrees a few, and then more, and then all the hairs turn grey, but, rather, in the sense that, at first, a papilla supplies less pigment to one and the same hair, and, consequently, the hair becomes of a greyish-brown colour, and that, ultimately, the pigment is entirely absent, and that thus the portion of hair which is formed subsequently appears wholly without pigment.

We often find that hairs which appear grey to the unassisted eye are seen, with the aid of the microscope, to contain pigment here and there in the cortical substance, and still more frequently in the medulla. Or we find that hairs which appeared coloured, are shown to have little or no pigment at certain parts when examined microscopically. We see, therefore, that the production of pigment may be diminished gradually in such a manner that it may, for the time being, be insignificant, or it may cease, or may for a time be again renewed; that is, that it may be irregular, not only in its intensity, but also in the length of time during which it lasts. The condition described has been also noted by others in part, but its true significance has never been comprehended and explained. Thus Pfaff* says quite correctly that the first white hairs, all of them still contain more or less pigment, and that the pigment, as a rule, only vanishes at an advanced age; but, instead of attributing this gradual diminution of the pigment to the diminished production of pigment by the papillæ, Pfaff refers

* Dr. Pfaff, *das menschliche Haar*, Leipzig, 1866.

it, unfortunately, to an unascertained and still less explanatory "condensation of the cortical substance."

In the preceding physiologico-anatomical exposition, will also be found the explanation of the premature and transitory atrophy of the pigment of the hair, of the origin of the brown and white "rings," of the alternations of brown and grey hairs in chlorosis, typhus, &c. Disturbances of nutrition which may or may not be discernible, besides causing a disturbance in the production of the hair itself (*Seborrhœa capillitii* and *Defluvium capillorum*) may also produce a special disturbance in the sense that the papillæ may supply little or no pigment; that the hair may become grey. And, after the disappearance of the disturbance of nutrition or of innervation, the function of the papillæ may be completely or partially restored, and the hair may again contain pigment.

Dr. J. Pincus, surgeon in the army, who has investigated the physiological and, in part, the pathological conditions of the hairs in more detail and more perseveringly than any one else, for a series of years, and who has published the results of his painstaking labours in a series of papers in the '*Archiv für path. Anatomie und Physiologie*,' arrives at similar data and inferences in regard to the "turning grey" of the hair. He says (*loc. cit.*, 45 Band, 1869, p. 180 et sequ):—"The rule is . . . this, that those hairs, or portions of hairs, which appear grey were developed grey in the place of their formation." Further, "the rule, therefore, is that when the hair is turning grey it is changed in colour at the part last formed; and this change results in most cases from a change in the formation of the pigment, in rare cases, from bulging out of the hair and its being filled with air, without change in the pigment." "Any follicle from which a grey hair has once become developed produces, usually, during the continued growth of the same hair, or in the substitution of another in its place in consequence of the physiological shedding of the hair—in either case, equally, a grey hair. As an exceptional circumstance, it may happen that a coloured hair is produced after colourless hairs have been formed for months; and such an alternation of the conditions of nutrition may even occur repeatedly in one and the same hair."

In reference to Pincus' remark, that in rare cases the hairs

may appear grey, "owing to their bulging out and being filled with air," it seems to us that he does not refer to his own observations, but to the statements of Landois and Wilson, to which we shall recur presently.

In short, it will be evident, from what has been said, that I only consider it possible for the hair to turn grey in the period required for the physiological growth of the individual hairs; and that, therefore, neither a single hair, nor all the hairs together, can turn grey otherwise than gradually—in fact, that they cannot become grey suddenly.

It is well known that the older literature is rich in narratives of cases in which the hair has turned grey in one night or suddenly. Thomas More, the Chancellor of Henry the Eighth, who was sentenced to death; the monk Ubipertus, who had to become grey in one night, in order to appear old enough for a bishop's mitre; Lewis of Bavaria, who had condemned his wife to death; the Spaniards Didaeus and Diego Osorius, who were awaiting execution; the well known Perat Leclère, who had to give testimony before the peers in the case of Louvel; the unfortunate Queen Marie Antoinette, and other persons who were compelled to suffer great anxiety, mental shock, physical exertion and privations (shipwrecked persons), terror, and peril of death of all sorts, are the heroes of these narratives by Fabricius Hildanus, Camerarius, Marcellus Donatus, Scaliger, Schenk, and others. Of modern communications, we must mention, with special regard to its authority, the case which was reported by Dr. Landois,* and was under the care of Prof. Mosler, of a patient affected with Delirium Potatorum who was stated to have suddenly become grey.

This "sudden turning grey" cannot be reconciled with the physiological growth of the hair, and the normal mode of its pigmentation. The older physicians have not taken any trouble whatever to explain such a phenomenon. Landois, however, Wilson, and Pfaff seek to explain it and the possibility of its occurrence, and therefore to support the credibility of such stories. They disregard the normal conditions of the growth of the hair, and seek, on the contrary, to discover local influences which, first of all, act suddenly on the hair, and, secondly, produce such an effect that the hair appears white. Landois states

* Virchow's Archiv, April, 1866.

that he has found bubbles of air in tolerable abundance in the medulla and in the cortical substance corresponding to the grey portions, that he has been able to get rid of these by means of warm water, turpentine, or ether, and that the grey colour vanished coincidently with the disappearance of the bubbles of air. Erasmus Wilson reports to the same effect respecting the case of a boy, aged $7\frac{1}{2}$ years, which he brought under the notice of the Roy. Med.-Chir. Soc., in London (March). By transmitted light, the white rings appeared of a dark colour, when viewed as opaque objects, they appeared as white as chalk. On dislodging the bubbles of air, which were found by Wilson in the hair, by means of saturation with fluids, the white rings disappeared also.*

In opposition to this stands the fact that bubbles of air may be and have been found in normally coloured hairs,† and that others, for instance, Griffith‡ and Steinlin,§ attribute the dark colour of the hair to the air contained in the medulla. Besides, we have never understood what was the nature of the "bubbles of air," or from what place they were developed so suddenly, and it seemed especially mysterious how hair which "had become grey" owing to the presence of a substance which could so easily be driven out, should remain so for the remainder of life; yet most of the persons who turned grey so "suddenly" remained so for the rest of their lives. There must, therefore, occur in such cases, not only the sudden turning grey from local development of gas, but, also, the formation of pigment from the papillæ must have ceased before the canities could become permanent. I, therefore, cannot believe that the explanation given by Landois will account either for his case, in particular, or for the facts in general. Had Landois reported that he had himself accurately examined the hairs of the patient

* Er. Wilson himself was not thoroughly satisfied with this result, and expressed the opinion that the white rings corresponded to the growth of the hair in the night. Landois ('Arch. f. path. Anat.,' &c., 45 B., 1869, p. 115) refutes the latter opinion by demonstrating that the length of the separate rings does not correspond to the growth during a period of a few hours only, such as the space of one night.

† Among others, Spiess, Henle's and Pfeuffer's Zeitschrift, 3 Reihe, v., B. 1.

‡ Canstatt und Eisenmann's Jahreshb., Erlangen, 1849, p. 34.

§ Henle und Pfeuffer's Zeitschr. f. rat. med., ix. B., p. 302.

the day before and had found them of a brown colour, and had then, the next day, seen them of a grey colour, we should not have hesitated for a moment to have accepted the fact, even without any explanation, and should only have looked about for some interpretation. Landois has not, however, done this.

Pfaff (*loc. cit.*) has deprived hairs of their colour by means of chlorine, a plan, however, which has been, for long, well known,* and is of opinion that the sudden turning grey of the hair is brought about by a "rapidly caustic fluid" which is secreted from the skin under the influence of mental affections. He has, however, himself, neither seen the hair turn grey suddenly, nor can he exhibit the "rapidly cauterising fluid," and this caustic may rank with the numerous teleological, humero-pathological, and natural philosophical propositions with which his treatise overflows.

Since, therefore, a case of sudden turning grey of the hair has not been demonstrated, in which the hair had been carefully examined before the suspected change; and since, further, no incontestable scientific support for such a phenomenon has been brought forward from any quarter, I believe I shall be justified in advancing the following propositions, founded on the results of physiologico-anatomical investigations:—

1. The hairs can only turn grey from their roots upwards, that is, from their papillæ, and, therefore, grow deprived of pigment.

2. The hairs can only turn grey within the space of time which is required for their physiological growth; consequently, they must become grey from below upwards and gradually.

If, however, the experience cannot be overlooked, that persons become grey in a "short time," yet this time occupies a space of at least many days or weeks, and, therefore, a period within which the hairs will not only have grown a perceptible distance from the follicle, but, also, will have so far advanced in the physiological (typical) renewal that a change in the formation of pigment will be perceptible to the naked eye in the general appearance of the hair. The canities will, moreover, be the more remarkable if the individual is young, and if, instead of the pigment being wanting from only a few hairs, as is the case in senile canities, all of them turn grey at the same

* Henle, *allg. Anatomie*, Leipzig, 1841, p. 305.

time, though always, as they evidently must do, from the root upwards; if, therefore, all the papillæ, at the same time, or in quick succession, cease to supply pigment in consequence of a general disturbance of nutrition.

Treatment.—It is impossible for us to check or cure the organic process on which the change of colour depends. The only indication which can be followed out is that of conveying pigment, artificially, from without to the hairs, so that the loss of the natural colouring may be hid as completely and as harmlessly as possible, *i.e.*, of dyeing the hairs.

In the fulfilment of this indication of treatment, we enter on the domain of the use of cosmetics. We will here, however, go so far, only, as may be necessary, or practically useful, to the physician, in order to become acquainted with the remedies most generally employed for colouring the hair, the method of their employment, and the way in which they act. That which is most in use in order to produce a “dark-brown” or “black colour” of the hair is nitrate of silver in watery solutions of various degrees of concentration. The hair, after having been previously well cleansed by means of soap and water, and allowed to dry for at least an hour, is painted over with the solution of silver. Under the influence of sun- (day-) light the well known decomposition of the latter occurs, and the hair becomes of a black colour. In order to prevent the scalp becoming blackened at the borders of the hair, on the forehead, temples, and on the neck, under the influence of the same agent, the adjoining skin must be washed with a solution of common salt immediately after tinting the hair by means of the solution of silver, for it is impossible to wholly avoid wetting the surrounding parts with the colouring material. A solution of cyanide of potassium is also quite efficient for this purpose, but, on account of its occasional dangerousness, should be avoided. Many commercial remedies for colouring the hair consist entirely of solutions of nitrate of silver.

Somewhat of a more complicated nature, but quite similar in their action, are the combinations of sulphur and iron, sulphur and lead, and sulphur and silver. Thus the older writers (Dr. Jahn, Chandelier, &c.), and, following them, Eble (*loc. cit.*), had already made use of the oil pressed out of the yolks of eggs (*oleum vitelli ovorum*) in order to blacken the

hair, professedly on account of the notable quantity of sulphur and iron contained in the oil. On the basis of this theory, the plan is recommended (Eble) of bringing iron and sulphur, separately, to act on the skin, where, only, at the moment of application, the blackening compound of sulphide of iron is produced. Old iron is allowed to rust in the air (oxidise), and from this is prepared, by pouring vinegar over it, acetate of iron, in technical language called iron liquor (dye). By rubbing up sulphur in a fatty oil, oil of yolk of egg, "balsam of sulphur" is prepared. The iron liquor is applied to the hair one day and on the next the balsam of sulphur. Solutions of acetate of lead act in the same way with sulphur.

There is a remedy in repute among hair dyers whose action can be regulated, and with which the hair may be coloured dark-blond, chatain, or black. It consists of (two) distinct fluids. One contains solution of nitrate of silver, which is less concentrated in proportion to the feebleness of the colour required. The other contains a solution of sulphide of potassium (liver of sulphur). The fluids are applied to the hair immediately after one another. The action depends on the combination of the sulphur with the silver. As a rule, these remedies require an acquaintance with the special effects of the separate colouring solutions, and mechanical dexterity in their application.

On account of the practical difficulty which is involved in the employment of these remedies, many patients and physicians are contented with agents which colour in a moderate degree. To this class belong all the fatty oils. By the use of these the hair is tinged of a darker colour and a darker gloss. Special favourites are oil of colocynth, oil of mace, oil of walnuts, oil of cassia, &c. In accordance with the above indications a combination of these and similar substances is recommended, in the form of a pomade, by Pfaff, as also effectual: *R. Olei ovorum recens pressi; Medullæ ossium bovis āā unciam; Lactatis ferri drachmam semis, Olei cassiæ aetherei scrupulum.*

A certain shyness has always prevailed among physicians and the laity in regard to the metallic hair dyes. There is a dread, having more or less foundation, of making the hairs brittle by their use. It is on this account, indeed, that the use of the above-mentioned remedies is as a rule preferred, in spite of their dyeing influence being less intense and trustworthy.

It is the more important, therefore, to mention a vegetable hair-dye, which has for long been in use very generally in the East (among the Persians), and which has often been employed by Dr. Pollak, formerly court physician to the Shah of Persia, in the clinique of Prof. Hebra, and in private practice, with satisfactory results. According to the statement of Dr. Pollak we are in a position to produce with it all shades of colour of hair, from a light-brown (dark-blonde) to a dark- (blue-) black. The Persians are in the habit, if their hair is not quite black naturally, of tinting it from time to time with this remedy in order to give it the dark-blue gloss. The remedy consists of the powder of the dried henna plant (one of the papilionaceæ) and of the powdered indigo plant. The first powder is formed into a thick paste by means of water and spread on the hair. After the lapse of an hour this appears of a red colour. A paste prepared from the powdered indigo plant is then spread on the first. Under the influence of warmth and moisture the black colour becomes apparent on the hair, covered with these two pastes, in the course of several hours. By a proper regulation of the quantities, of the length of time, of the degree of moisture, &c., under which the application of the two pastes is made, and their mutual reaction which results, the different shades of colour may be produced. Much special experience is undoubtedly required to carry out this plan, for we have seen, even in the experienced hands of Dr. Pollak, a colour produced which was some degrees removed from what was desired.

CHAPTER XLIII.

(CLASS VII.—DIV. II.)

ATROPHY OF THE HAIR.

By atrophy of the hair, we mean a morbid disturbance in the physiological growth of the hair.

This disturbance may either be chiefly characterised as an alteration of the general nutrition of the hair, *i.e.*, of what is commonly called the “growth of the hair;” in which case the whole of the hairs undergo a limitation in development, in their normal continuance, and in their regular renewal. Or, the disturbance is manifested chiefly by a distinct alteration in the structure of individual hairs. Though both of these conditions, for the most part, occur in combination, yet the character of one of them will predominate at one time, and of the other at another, in the clinical features of the affection. And in a corresponding manner we shall treat separately of the deficient growth of the hair and of the defective structure of the hair.

a. *Deficient Growth of the Hair, Alopecia.**

I include under the general name Alopecia all the forms of deficient growth of the hair—they may be either congenital or acquired; may be set up by demonstrable or less ascertainable causes; and may exhibit a distinctly regular or an irregular form or mode of progress.

a. *Congenital, deficient Growth of the Hair, Alopecia Adnata.*

It is not infrequently noticed that children are born with a very scanty growth of hair (oligotrichia), or with a total want

* The oldest authors comprehended under the term Alopecia merely the “falling out” of the hair, and kept chiefly to the definition of Celsus (Lib. vi., cap. iv., edit. Haller, Lausannæ, 1772, p. 4, Tom. ii.).

of hair (atrichia). Commonly, the hairs are wanting in such cases on certain parts where they are usually present (A. partialis), for instance, on the scalp; the skin on the perfectly bald patches is smooth, and is unaltered as regards its colour and texture (Fuchs, loc. cit., p. 21). Or, the hairs are wholly wanting everywhere, Atrichia universalis. Such cases have been mentioned by the older authors (Hippocrates, Procopius, and others), as well as in modern times by Danz,* Steimnig,† Augustin,‡ and others. In Danz's cases, in which the patients were two grown-up persons, the teeth were wanting as well as the hair. In the cases which I saw myself of scanty growth of hair in children, the teeth became developed at a very late period.

As a rule, the congenital absence of hair is only a transitory condition. In the course of the first few years of life this want of hair becomes supplied wholly, or, at least, in part; fine, downy hairs can be detected. Occasionally, however, the hairs fail to appear at any time, as in the case of a man, 32 years of age, whom Rayer§ saw, though, even in him, in many places, "extremely fine, colourless hairs" were present.

Just as in the case of every other form of congenital deficiency of formation, an hereditary predisposition must be regarded as the cause. However indefinite such a view may appear, yet it obtains a certain amount of support in those cases in which the want of hair is met with in several members of the same family, for example, in a brother and sister, mentioned by Steimnig and in Rayer's case.

b. *Acquired deficiency of Growth of Hair, Alopecia Acquisita.*

A morbid interference with a fully developed growth of hair may result, on the one hand, from a preponderance of the physiological falling out of the hairs, and, on the other hand, from a diminution in the regular production of new hairs. The direct result of this disturbance in the conditions of growth of

* Stark's Archiv f. Geburtshilfe, B. 4, p. 684.

† Froriep's Notizen, 26 B., No. 4.

‡ Asclepion, Jhrg. 1812, 3 Heft.

§ Loc. cit., 3 Band, p. 331 (Ausgab. v. Stannius, Berlin, 1869), François Beauvais, a patient in the Hôp. de la Charité, 1827.

the hair is, in the first place, a thinner* growth of hair, and, finally, the total laying bare of larger portions of skin—baldness.

Predominating shedding of the hairs, a scanty growth of them, and baldness are, therefore, the three mutually dependent, clinical, characteristic symptoms of Alopecia acquisita.

According to the special regard paid to the one or the other of the symptoms mentioned, authors have also given names to the disease, and, at one time, have been struck by the shedding of the hairs (*Effluvium Capillorum*, *Defluvium Pilorum*, *Lapsus Pilorum*, *Epilatio*, *Psilosis*, &c.), and, at another time, have selected the baldness as the characteristic symptom of the disease.

The oldest authors, of whom I will only mention here Celsus,† Galenus,‡ Mercurialis,§ Sauvages,|| and Lorry,¶ because the first gave the starting-point for explanations which have been amplified largely by the two latter, gave a good deal of attention to baldness, owing to its being a permanent and particularly striking symptom.

Whilst Celsus treated of the disease merely in two distinct chapters (*De Effluvio Capillor*, cap. 1, and *De Areis*, cap. 4), Mercurialis had previously made more subdivisions (following Galen, Oribazius, &c.). He regards "*Defluvium Capillorum*" (cap. 3, Lib. 1) as a consequence of general febrile diseases; Alopecia and Ophiasis (cap. 4, Lib. 3) as two kinds of baldness, which are only distinguished from one another by their form, since the first represents a scattered shedding of the hair, the latter a baldness, which progresses from the vertex to the temples; and, lastly, *Calvitium* (cap. 5, Lib. 1) which represents merely baldness of the front part of the head and the senile baldness of the male sex.

In the course of time, much attention was paid to the varieties in mere external form, and in Eble (*loc. cit.*, p. 252) we find, for example, the following forms cited:—

* "Schütter"—a common expression in Austria for "dünn gesät" (thinly scattered).

† *Loc. cit.*, pp. 1 and 4.

‡ Lib. 1, de comp. med. sec. loca.

§ 'De morbis cutaneis.' Venetiis, 1601.

|| 'Nosolog. method.' Amstelodami, 1768.

¶ 'Tractatus de morb. cutaneis.' Parisiis, 1777.

1. Alopecia, a diffused shedding of the hair of the head and of the beard.

2. Phalacroasis s. Calvities (Arnaldia), when the baldness affects, chiefly, the front of the head.

3. Ophiasis, when the hairs begin to fall out at the back part of the head and in such a manner that a hairless strip is formed, of the breadth of two fingers, which passes towards both ears, and frequently, also, towards the forehead. (Definition from Celsus, loc. cit., p. 4.)

4. Opistrophalacroasis, baldness progressing from behind.

5. Hemiphalacroasis, one-sided baldness.

6. Anaphalantiasis, loss of the eyebrows.

7. Alopecia areata (area Jonston, Sauvages), circular patches of baldness.

8. Madesis s. Madarosis, "thinning" of the hair.

This, and every similar division of alopecia, having regard only to the form of the baldness, neither represents the actual conditions nor the practical requirements.

The long used and, so to speak, natural division of alopecia into A. Senilis and A. Prematura, seems in my opinion more suitable. It not only is most in accord with the influences just mentioned, but leads, also, on more careful consideration, to the idea of the pathological entity of the disease, as well as to an insight into the essential process and causes of Alopecia.

1. *Alopecia Senilis.*

Calvities, C. Senilis, the baldness of old age.

According to experience, a bald head is met with most frequently in persons who are advanced in years. As a rule, the hairs are wanting over a space extending from the upper border of the forehead to the vertex, and, laterally, near to the middle of the parietal region. The back of the head, the lower portions of the lateral regions of the skull, and the temples retain the hair longest. The shedding of the hair begins, for the most part, at the anterior border of the hairy scalp, on the forehead, so that the latter appears lengthened towards the vertex (the brow of old age). Frequently, however, an anterior corona of hairs remains just at the upper border of the forehead, and the baldness affects the vertex, only, to a greater or lesser extent. The

scalp, thus deprived of hairs, appears smooth, stretched, glistening (hence "bald pate"), of a reddish aspect, and thinned. The mouths of the hair follicles, in the early stages, are more easily recognised; in the cases in very old people, they are only here and there perceptible to the naked eye. In a similar way, the little points are seen to be universally, or only sparingly, beset with fine, small, slightly coloured, downy hairs.

Men are much more frequently affected with baldness in old age than women. No cause for this is known.

The hairs always turn grey (*Canities Senilis*) before they are shed. It must not in any way be asserted, however, that the alteration in colour necessarily leads to alopecia. There are plenty of old people who have a very luxuriant growth of hair, though it may be of the purest silver grey colour. The loss of the hair, principally, and as a rule, affects the vertex. The hair of the beard and of the genitals may also fall out to a great extent, without, however, any baldness occurring. I do not think it has ever been asserted that a considerable shedding of hair is a frequent occurrence in these regions.

The question as to the cause of senile alopecia cannot be answered in any other way than with the phrase *senile involution*, and in no case without regard to the anatomical changes met with in this condition. At the same time, it remains doubtful whether the very slight anatomical changes met with are to be regarded in the light of a cause of the senile baldness, or rather as a consequence of it.

If we examine sections of the bald skin of old persons, we shall obtain very various results as to the condition of the skin itself, of the hair follicles, and of the sebaceous glands, as well as in regard to the presence or absence of hairs generally, according as we examine parts which have only been affected a comparatively short time, or which have been bald for years, or according as we obtained sections from portions of skin, in continuity with one another, or distinctly separated. By paying attention to this circumstance we may explain the, in part, very contradictory statements of authors. At one time, we find the skin thinned in its whole structure, the fibrillæ of the connective tissue wasted, the fat-cells few in number and shrivelled—in short, the signs of atrophy such as have been described by

Wedl,* and recently by Neumann.† Another time, or on certain bald parts in the same individual, the signs of atrophy of the skin are less manifest.

Here and there, the sebaceous glands are not to be found at all; at other points, they are present in considerable quantity, and are not at all altered. Simon (loc. cit., p. 377) and Neumann have always found sebaceous glands; the first gives drawings of them (Taf. 6, figs. 2 and 3), and the latter has even found them considerably enlarged (loc. cit., 293). In any case, this enlargement is only to be understood as relative to the hair-sacs, for, after the baldness has continued for a long time, the hair follicles, their papillæ, and the root-sheaths actually shrivel, and the cells of the latter become fatty. Hence, some authors have not been able to find any hair-sacs present at all (Bichat‡); others have found them diminished in size here and there only (Simon), or have seen them quite unaltered (E. H. Weber§). In the hair follicles which still remain there are generally found fine, downy hairs present. The older the canities, the more frequently do we find evidences of shrivelling in the elements of the hair-sacs, fatty degeneration of the cells of the root-sheaths of the hairs, and the like.

If we try to make use of the preceding anatomical results to explain the shedding of the hair, and the cessation of its growth in old age, we are unable to arrive at more than a mere outline of a vague theory. We are only justified in saying that in conjunction with the shrivelling of the tissues, the formation of the hairs is interfered with, that the existing hairs fall out before they have reached their proper age, and no new hairs are formed any more to supply their place.

Alopecia senilis is incurable.

2. *Alopecia Præmatura, Premature Baldness.*

As the name itself indicates, Alopecia Præmatura signifies baldness coming on during early life.

* 'Grundzüge der pathol. Histologie.' Wien, 1854, p. 183.

† 'Lehrbuch der Hautkrankheiten.' Wien, 1869.

‡ 'Allgem. Anatomie.' Uebers von Pfaff, Leipzig, 1803, 2 Th., 2 Abth., p. 300.

§ Hildebrandt's 'Anatomie,' Bd. 1, p. 196.

which the hairs are deficient. On this account, they have been frequently confused with one another by subsequent writers.

Thus Alibert, for instance, declares his *Porrigo tonsoria* and the *Teigne tondante* of Mahon to be identical with the *Porrigo decalvans* of Willan, notwithstanding that such a confusion might easily have been avoided by careful attention to the description, cited above, which Willan gave of *Porrigo decalvans*.

This confusion was increased by the fact that Mahon's *Tinea tondens** (1829), without any regard to the preceding literature, that is, Willan's account, especially, found favour, because it corresponded very accurately, on the one hand, to the characteristics of one form of bald circular patches on the scalp, and, also, because Gruby,† following Audouin of the Academy of Sciences, 1843 and 1844, demonstrated a microscopic fungus which was found, as was supposed, in "*Porrigo decalvans*," and which surrounded the hair in a layer 0.015 mm. (.0006") thick, and which he called *Microsporon Audouini*, whilst the disease itself was named *Phyto-alopecia*. Cazenave had, however, already, in 1840, described the circular bald patches on the head, caused by loss of hair, on which he found vesicles and scales, and which were, therefore, identical with the *Porrigo scutulata* of Willan (scald head, common ringworm of the English), as *Herpes tonsurans*.

We have, therefore, up to this time, as designations for the circular, bald patches on the head produced by loss of hair, *Area*, Celsus; *Alopecia Areata*, Sauvages and Jonston; *Porrigo scutulata* (common ringworm), Willan; *Porrigo decalvans* (bald ringworm), Willan; *Porrigo tonsoria*, Alibert; *Tinea tondens*, Mahon, jun.; *Tinea Pellada*, Pelade, and *Herpes tonsurans*, Cazenave.

On account of the fact that, in *Elephantiasis Græcorum* (*Lepra*) circumscribed bald patches may also be met with, and were noticed especially by the Arabians and by the older writers, *Mercurialis*, Sennert, Lorry, &c., arose the names of *Tyria*, *Morphœa*, *Albarras*, *Vitiligo* (Cazenave and Biett), *Leuke*, *Alphos*, &c., of the Greeks and Arabians, which, however, were only used or regarded by few in their strict signification (see antea, p. 129, chapter on *Vitiligo*). Even Cazenave, in 1856, quite

* 'Recherches sur le siège et la nature des Teignes par M. Mahon jeune,' Paris, 1829, 133 et sequ.

† 'Comptes rendus,' &c., 1843, xvii., p. 301, and 1845, p. 586.

incomprehensibly confused the second kind of circular bald patches with simple loss of pigment occurring in a circular form, and designated and figured them* under one description, full of contradictions, as vitiligo, after having shown himself better informed by his differentiating *Herpes tonsurans*.

Hebra, in the text in connexion with Taf. vii. A, in the 2nd Heft of his 'Atlas of Skin Diseases,' published in the year 1858, distinguished clearly between the clinical symptoms of Alopecia areata and those of *Herpes tonsurans*. It is true that he has at the same time accepted the statements of Gruby in reference to the presence of a fungus in Alopecia areata as satisfactory, but he has since changed his opinion, and no longer considers Alopecia areata to be a parasitic disease.† The multifarious investigations which have been made since the year 1840, with increasing eagerness and range of research, in regard to the vegetable parasites of the skin, and of which we must treat further on, have not led to any conclusive decision with respect to Alopecia areata.

However, clinical observation has resulted in this amount of success, that the supporters of the parasitic nature of Alopecia areata, such as Bazin,‡ are compelled to admit that the disease has a character of its own.

The majority of dermatologists hold the more firmly to the clinical peculiarity of Alopecia areata in proportion as they, v. Bärensprung,§ Hebra,|| Wilson,¶ Neumann,** Böck,†† Dühring,‡‡ Scherenberg§§, myself, and others,||| do not admit the existence of a fungus in Alopecia areata, and consequently take care not to confuse the disease with the parasitic *Herpes tonsurans*.

* 'Traité des maladies de cuir chevelu,' Paris, 1850, p. 281, pl. viii.; and 'Leçons sur les maladies de la peau,' Paris, 1856, p. 146.

† I am not a little surprised to find that Neumann attributes an opposite opinion to Hebra ('Lehrb. d. Hautkr.,' 1869, p. 297).

‡ 'Die parasitären Hautaffectionen,' Deutsch. v. Kleinhans. Erlangen, 1864, p. 94. Tinea Favosa—tonsurans—und Pellada.

§ 'Die Hautkrankheiten.' Erlangen, 1859, pp. 112, 113.

|| Vorlesungen.

¶ Loc. cit., p. 722.

** Loc. cit.

†† 'Archiv für path. Anat., &c., B. 43, p. 336 (Taf. ix.).

‡‡ 'Pathology of Alopecia areata,' 'Amer. Jour. of the Med. Sciences,' July, 1870.

§§ Virchow's 'Archiv f. path. Anat., &c., 46 B., 4 Heft.

||| Dyce Duckworth, St. Barth. Hosp. Rep., v. viii., 1872, pp. 144-170, 'On the Nature and Treatment of Porrigo Decalvans,' with four plates.—Tr.

Symptoms, Development, Course.—Alopecia begins, as a rule, on the hairy scalp, in a single patch, not infrequently, however, in several isolated patches irregularly distributed, and appearing either simultaneously or with only short intervals between them; more rarely, it commences on the beard. On these patches, the hairs are shed from their follicles, without their having previously broken off beyond the level of the skin, and the shedding spreads from these parts peripherally, as from so many centres. In this way, a corresponding number of isolated, discoid, bald patches are produced on the hairy scalp, and are surrounded by an apparently quite normal, or often luxuriant, growth of hair, according to the habitus of the person affected.

The portion of skin which is wholly deprived of hairs appears quite normal. It is neither reddened nor swollen, but smooth (not desquamating), supple, of a paler, whiter colour (less pigmented) than the scalp generally, and studded with fine, punctate pits, which correspond to the open mouths of the hair follicles. These are not occupied by the stumps of hairs. It is but very seldom that one of these pits has a black point at the bottom of it—the remains of the deeply pigmented hair-bulb. For the same reason, the bald patch is evidently much whiter than a patch which has been shaved, or from which the hairs have broken off, because, in the latter case, the mouths of the hair follicles would appear black, owing to the stumps of hairs projecting from them. The bald patch occasionally appears to be somewhat elevated above the level of the adjacent parts. Mostly, its surface is situated at a perfectly normal level. In the later stages, it seems as if the patch were slightly depressed.

The latter condition, which is said to be accompanied, at the same time, by diminished sensation in the patch (Scherenberg, loc. cit.), appears to be alluded to by Neumann when he speaks of a peculiar malady,* which he names Alopecia circumscripta, after Fuchs.

The hairs immediately surrounding the patches of Alopecia areata adhere but loosely to their follicles. They come out in tufts on the slightest traction. They are also shed spontaneously. It is in this way that the bald patches increase in size, since the

* 'Hautkrankheiten, 2 Auflage.

hairs fall out over steadily increasing circular areas. In the course of a few weeks or months, discoid bald patches of the size of sixpences or of half-crowns become as large as the palm of the hand. The patches which were at first isolated approach one another and unite so as to cover areas of larger extent, having the shape of a figure of 8, of a trefoil leaf, or of a biscuit, and having irregular outlines. By this time, the patients are no longer able to conceal the bald patches by means of the hairs remaining on the adjacent healthy parts. Their baldness remains in future quite evident.

At this stage, or even earlier, the process may be arrested. This becomes evident from the fact that on the one hand the hairs adjacent to the bald patches become more adherent and at last quite firmly fixed, and, on the other hand, that light coloured, slightly pigmented, fine, woolly hairs make their appearance on the bald patches themselves. These are also partly shed. They increase, however, in number, and also, in course of time, in length, thickness, and pigmentation. In a few weeks, the part is again uniformly covered with a growth of normal hairs. Now and then, the progress of the Alopecia areata is arrested on all the parts attacked at the same time. At another time, it ceases to spread at certain points, only, which become covered with hair in the manner described, whilst, at other parts, it continues for a time longer and until the patches have attained a certain size, when, at length, the hair grows again here also. A patch which has become cured may, not infrequently, be denuded again, or even several times more, by a repetition of the same process.

After the lapse of many months, or one or two years, however, the growth of hair has everywhere, as a rule, become restored—the disease has vanished.

In a few unfortunate cases, the shedding of the hair is not checked, but the baldness steadily increases in extent, new centres of alopecia arise simultaneously in various regions of the body and spread peripherally. The hairs are shed universally, the hairs of the head, the eyebrows, the eyelashes, the beard, and the axillary and pubic hairs. Two years ago, I saw a physician from Galicia who was affected by the disease to the extent just mentioned. With the exception of numerous woolly hairs, which still existed everywhere, he was quite bald on all the

parts mentioned. Even when the Alopecia areata is so widely diffused, the restoration of the hair takes place in the same way as in the less severe forms of the disease; that is to say, at the outset, only fine woolly hairs spring up, which gradually increase in number, thickness, pigmentation, and stability. In any case the process occupies many years. Occasionally, however, the improvement only advances to the production of lanugo-hairs, which, therefore, conceal the loss but imperfectly, more especially because they are less permanent than well developed hairs. In such cases, which, fortunately, occur but very rarely, no cure, properly speaking, can be expected to result.

Prognosis.—It will be evident from what has been said that Alopecia areata is, for the most part, curable. It is, however, very annoying, as, owing to its protracted course, extending over months and years, the patients are disfigured all this time by the patchy or diffused baldness. And even though, as a rule, a complete cure may result, yet such a deformity is a very great drawback to intercourse with other people, and to the pursuit of any occupation, especially if the loss of hair has affected the eyebrows and the eyelids. In this respect, Alopecia areata, if spread over the whole body and not subsequently cured, may be called a great misfortune. Patients are, for the most part, so sensitive to this as to be very much depressed morally, and even to be tired of life.

Anatomy.—Though so many investigations have been made in various quarters in reference to the anatomical conditions of the skin and hairs in Alopecia areata, yet they have not led to any positive results explanatory of the morbid process. In the first place, we must acknowledge those which are founded on supposed positive discoveries, such as Rindfleisch has recorded in the Archiv 'für Dermatologie und Syphilis,' in connexion with a "single" case observed by him.*

Rindfleisch found a nodular swelling of the hair "between the hair-bulb, on the one hand, and the narrowest part of the follicle, on the other (loc. cit., fig. 1, b). This nodular swelling is not quite constant, but was only absent, at most, once in ten times. This nodular swelling depends on the condition of the youngest hair-cells, which have not become hornified, they are in a state of "pseudo-hypertrophy." This pseudo-hypertrophy is

* Loc. cit., 4 Heft, 1869, p. 483, und Taf. iv.

caused by the fact that the fully-formed hair situated beyond advances no further, owing to the want of the "force which, overcoming the lateral pressure of the root-sheaths, keeps the hair moveable and allows of its propulsion." "The defect of the growth of the hair which results in this way forms the most natural explanation (according to Rindfleisch) of the separation of the former from the latter. The means by which this separation is produced consists in a fatty, granular metamorphosis at the junction of the two."*

The sole, positive observation noted in the diffuse and involved account of Rindfleisch, is the "nodular swelling," and that "this is not constant." I have examined the hair in all the cases of Alopecia areata, amounting to upwards of fifty, which have come under my notice since the year 1866. I have often found such a swelling. It is quite evident that it is owing to a cuff-like inversion of the root-sheath which remains attached to the hair, the concavity of the fold looking towards the root of the hair. This appearance can be best seen after the addition of acetic acid. That which, however, at once deprives this discovery of any value whatever in reference to Alopecia areata, is the fact that precisely similar "swellings" may be seen on hairs which have been extracted from cases of other diseases, especially when the hairs are loosened and ready to fall out, for example, in seborrhœa or pityriasis of the hairy scalp, or, indeed, even when the hair is in a state of healthy growth. This inversion of the root-sheath is obviously of mechanical origin. As the hair is extracted, and the root-sheath partly follows it and partly remains firmly attached to the wall of the hair follicle, it is drawn from below upwards and inwards, and, also, by being dragged onwards through the follicle, it is inverted, and its external portion becomes the lowest. Just in the same way as a sleeve which fits tightly round the wrist, in front, becomes inverted when the arm is withdrawn from it. I also found, in addition, appearances which may be seen in any hairs which fall out easily, not merely in connexion with Alopecia areata. This was, more particularly, a loosening and fissuring of the hair-root, whose elements, though they certainly remained in the condition of cells, also contained an abundance of fat- and pigment-granules, and appeared less adherent to each other.

* See also Duckworth (loc. cit.), p. 156.—Tr.

With the exception of the above, there has not, hitherto, been any other positive statement recorded from any quarter as to the anatomical conditions met with in Alopecia areata. The fact that the hairs have been said to be split at their summits is of no importance. This occurs in connexion with an otherwise normal growth of the hair. It is not at all true that the hairs are remarkably harsh or brittle, and break off easily, or that the latter is at all characteristic of Alopecia areata. It has been already stated, at p. 208, that Gruby believed he had found a fungus—*Microsporon Audouini*—in Alopecia areata, that neither this fungus nor, indeed, one resembling it, has been seen by anyone else, and that, therefore, Gruby's discovery must be attributed to his having confused Alopecia areata with *Herpes tonsurans*.

Etiology.—If we bear in mind the unsatisfactory results of the frequently repeated examinations, carried out by myself and others, of the anatomical conditions, and, moreover, that Gruby's statement, above mentioned, in regard to the presence of a fungus in Alopecia areata stands alone, and, certainly, does not refer to Alopecia areata, but to a case of *Herpes tonsurans*, guided by the influences last detailed, we shall arrive at the same result as Rindfleisch, but by a shorter route, that is, we shall accept the view that Alopecia areata is caused by a lesion of nerve function, which takes the form of a disturbance of nutrition (*Trophoneurosis*) of the formation and reproduction of the hair.

This supposed nerve alteration has been demonstrated clinically in a few cases of Alopecia areata, which have been accurately observed. Thus, Wilson* reports the case of a lady in whom the onset of the area was preceded by neuralgia of the trunk and of the head.

In the cases which have been narrated, in which several members of the same family have been affected, such, for instance, as the one reported by Wilson, where a brother and sister, an uncle and his father, suffered from Alopecia areata, and Scherenberg's case (*loc. cit.*), in which it occurred in a brother and a sister, there must be a congenital predisposition to a specific trophoneurosis, just as other neuroses may particularly affect several members of the same family.

This view as to the nervous origin of Alopecia areata obtains

* 'Journal of Cutaneous Medicine,' April 1869, p. 99.

further support from the fact that the process begins at different points, and spreads from these peripherally, that it appears suddenly, without any antecedent, visible, anatomical changes in the structure of the skin, and stops just as suddenly, and, lastly, that at the same time the regular growth of the hair again commences.

Hebra pointed out, several years ago, in various diseases of the skin, more especially those of an exanthematic nature, variola for example, the coincidence which exists between the eruption and the peripheral nerve distribution. V. Bärensprung has repeatedly expressed himself to be of the same opinion; and this idea, which was founded in great part on clinical experience, has received a more matter of fact support from the anatomists, more especially from the classical and laborious investigations of Voigt,* and also from Eulenburg.†

Age, constitution, and sex do not appear to exercise any influence on the production of Alopecia areata. The disease occurs equally in young children, in adults, and in old persons, in men as well as in women. We may add that the patients, for the most part, have a growth of hair in other parts which might be called luxuriant. I have never seen Alopecia areata in persons who had a remarkably scanty growth of hair, or who had any other kind of alopecia.

From the etiology of the disease, it follows that we must regard Alopecia areata as non-contagious.‡

Treatment.—It will readily be understood that in dealing

* 'Ein System neu entdeckter Linien an der Oberfläche des menschlichen Körpers,' Octoberh. der math. nat. Kl. d. k. k. Ak. d. Wissenschaften, B. xxii., s. 240, 1856; und 'Beiträge zur Dermatoneurologie nebst einem Systeme,' &c., 1864, d. k. Ak. d. W., vorgelegt am, 14 October, 1862.

† 'Neuropathologische Studien,' Berlin, klinische Wochenschrift, 1867, No. 17 et sequ. Sep.-Abdr., p. 7. See, also, O. Simon, 'Die Localisation der Hautkrankh.,' mit. 5 Taf. Berlin, 1873.

‡ Prof. Wyss, of Zürich, has seen Alopecia areata develop in one individual who had been taking arsenic for a long period, and is rash enough to say that the Alopecia areata was due to the use of the arsenic. In cases of Psoriasis and Lichen ruber we have administered to a very large number of patients as many as 2,500 Asiatic pills in uninterrupted succession, and corresponding doses of Fowler's solution, without Alopecia areata having made its appearance. And, conversely, none of the patients who have come under our care with Alopecia areata have ever taken arsenic. So much for Prof. Wyss' rash conclusion.—AUTHOR.

with such a disease as Alopecia areata, which may lead to such disfiguring premature baldness, medical aid is very urgently desired. Unfortunately, the physician's performance corresponds but very imperfectly to the patient's desire. The best we can give the patient is the assurance, which will not be disappointed in the majority of the cases, that the baldness will vanish in course of time. As, however, many months, and even several years, will be taken up in the process, medical applications must be employed, as well as hopeful words.

The advice which was indicated first of all by Celsus, and definitely expressed by Willan and Bateman, that the skin should be roused into activity, that it should be moderately stimulated, agrees with the idea which we have entertained of the essential nature of Alopecia areata in general, that is, that it is a trophical disturbance.

Our treatment, therefore, is of a corresponding nature. As a rule, we employ frictions with ethereal oils in alcoholic solutions, or stimulating alkaloids dissolved in alcohol. For example, two drachms of oil of mace, and two ounces each of rectified spirit and spirit of lavender, or eight grains of veratria, three ounces of brandy, an ounce of spirit of lavender, and half an ounce of glycerine. Or, *R. Aconitini, gran. quatuor ad spirit. vin., &c., unc. quatuor.* Or, *Tinct. Veratri, Tinct. Aconiti, Tinct. Cantharidis, Tinct. Capsici, &c.,* in alcoholic solutions in the proportion of from ten minims to half a drachm to the ounce, and with the addition of small quantities of ethereal oil; for example, two drachms of *Tinct. Veratri*, six ounces of *Sp. Vini. Gallici*, half an ounce of *Glycerine*, and half a scruple of *Ol. Rosmarini*. We may also use tar, carbolic acid (one drachm to six ounces of alcohol and one ounce of glycerine), ether, &c.

Any of these solutions and alcoholic ethereal fluids may be rubbed into the bald patches and the skin of the immediate neighbourhood once or twice daily, by means of a stiff brush. If the skin is markedly reddened and scaly, the application must be made less frequently, and must be weaker.

There is no one of the remedies above mentioned, or of any similar ones, which has any markedly superior effect in Alopecia areata, since it cannot be said of any of them that they can check the progress of the malady. It is certain that Alopecia areata gets well during the use of any of them, and as this pro-

cess of cure takes usually a long time, we are often compelled to change from one to another.

Our experience has led us to think that if alopecia heals quickly after the use of a fresh drug, this result is to be attributed to the advanced period of the disease, rather than to the remedy. We think also that it is very advisable to extract the loose hairs daily, in addition to the employment of the washings and frictions mentioned, and the like. The hairs should be pulled out, not only from the bald patches, but also to such a distance around them that the firmly fixed hairs are reached. It has seemed to me that after epilation carried out in this way I have observed a check in the shedding of the hairs ensue more quickly.

An idiopathic shedding of the hair occurs also under other forms, but these, usually, neither come so frequently under observation nor present so well-defined a clinical aspect as the Alopecia areata just described. They exhibit, however, still more clearly than this the causative connexion between the nerve-disturbance and the baldness.

The cases to which we allude are those in which the hairs, corresponding to the peripheral distribution of one particular nerve, fall out after the function of the latter has been interfered with, whether it be from its having been cut across, from disease of the nerve-centres, or from spontaneous disease of the nerve.

Thus, Ravaton* mentions the case of a man in whom amaurosis of the right eye, as well as loss of colour and shedding of the hair of the scalp, of the eyebrows, and of the eyelids, on the same side, resulted from a violent shock. Romberg† saw bald patches develop on the head of a girl, suffering from a trophic facial palsy, on the affected side. Steinrück‡ noticed that in rabbits, in whom the sciatic nerve had been divided, the hairs on the corresponding extremity ceased to join and were partly shed. Cooper Todd§ reports a case in which in consequence of a concussion of the brain from a fall, hemiplegia and

* Rayer, 'Darstellung der Hautkrankheiten,' Deutsch. von Stannius, Berlin, 1839, 3 B., s. 337.

† 'Klinische Ergebnisse,' Berlin, 1846.

‡ 'De nervorum regeneratione,' Diss. inaug., Berol, 1838.

§ 'The Lancet,' ii., 1869.

alopecia of the hairs of the beard and of the head occurred. Also another case, in which the hairs and nails were shed after the patient had been struck by lightning.

There are also, undoubtedly, many instructive facts of a similar character to be gathered from the experience of the neuro-pathologists.

From the latter is also to be expected proof how far the statements are founded on scientific fact, according to which loss of hair may arise from general nervous excitement or depression, a depressed frame of mind, intense mental employment, excesses in *Baccho et Venere*, &c.

It is well known to me, as well as to others, that, under circumstances such as those mentioned, premature baldness may become developed; but I believe that, as a rule, even under such conditions, the whole organism is lowered in its nutrition, that, then, chlorosis and anæmia are developed, and, in consequence of these, *Seborrhœa capilitii*. The latter, at any rate, as will be shown in a later chapter, is the most frequent and direct cause of premature alopecia.

b. *Alopecia Præmatura Symptomatica.*

We understand by this form of alopecia the baldness which occurs as a direct consequence of disease of the structures of the skin, that is, of the hair follicles and the sebaceous glands. Since the latter are most intimately related, anatomically, to the hairs, any disease which affects them must also exercise a disturbing influence on the growth of the latter, and will lead to excessive shedding and scanty subsequent reproduction, consequently, therefore, to baldness.

The alopecia, under such conditions, therefore, is a symptom of the disease of the structures named. The form, extent, duration, intensity, curability, &c., of the alopecia produced in this way must be wholly dependent on the existing cause. It forms, in this respect, an integral part of the symptomatology of those diseases themselves.

In the description of the suppurative diseases of the follicles, represented by sycosis and acne, the phenomenon of the accompanying loss of hair has been already appropriately dealt with. The hair falls out because, on account of the purulent infiltration

of the root-sheaths and of the cells of the hair-root, the mutual connexion of these structures with the hair, and of this with the papilla, is loosened.

If the hair is pulled out sufficiently early and the pus thus let out from the follicle, the latter returns to its normal condition and the hair is replaced by another. If, however, the papilla or the wall of the follicle has been spoiled to any considerable extent by suppuration, then partial or complete destruction of the follicle from cicatrisation may result, and the hair may never be reproduced. This is to be regarded as the manner in which the loss of hair and baldness which arise in consequence of similar affections are generally brought about.

The hairs are shed, in a similar way, from single follicles or from groups of them, in Acne, Sycosis, Variola, the small papulo-pustular Syphilide (Lichen-acne-varicella syphilitica*), Lichen scrophulosorum,† Lichen ruber, Herpes tonsurans, Lupus erythematodes, Favus, and many other processes which attack the follicles in the form of inflammation, suppuration, &c. In both of the last-named affections, bald patches of the size of a half-crown or of the palm of the hand become developed, in consequence of the ulceration and cicatricial destruction of the follicles. In accordance with the configuration of this primary affection, the consecutive alopecia occurs in the form of distinct patches, and is, also, correspondingly, at one time transitory and at another persistent.

The alopecia which arises in consequence of a diffuse inflammation of the hairy scalp is of special importance, on account of its comparatively rapid onset and also of its widely spreading tendency. Such diseases are, acute and chronic eczema of the hairy scalp, psoriasis, and erysipelas.‡ These processes are, properly speaking, forms of dermatitis, which, at first, are comparatively superficial and subsequently extend more deeply. The hair follicles and the sebaceous glands cannot remain free from the exudation which accompanies these processes; by this exudation the elements of the root-sheaths of the hair, as well

* Microscopic sections of the small pustular syphilides are very instructive on this point.

† Kaposi (Moriz Kohn), 'Ueber Lichen scrophulosorum,' Sitzungsber. d. k. Akad. d. W., lviii. B., Octoberh. 1868, Taf., fig. 2.

‡ See the chapters on these subjects in vols. i. and ii. of this work.

as the hair-roots, become loosened, and the hairs, becoming separated from their organic connexions, must fall out.

The shedding of the hair occurs, as Simon remarks, quite truly, in the same way as the whole epidermic layer desquamates after a merely superficial serous exudation has persisted some time.

For this reason, also, the loss of the hair never ensues in the first stage of erysipelas or of eczema, to the latter of which we must point as affording the most satisfactory information. If the eczema has an acute course, the shedding of the hair appears during the stage of desquamation of the epidermis (Pityriasis), and if the eczema is chronic, then the hairs fall out during the continuance of the latter. In such cases, the alopecia is generally diffused, like the inflammatory process, over the whole of the head, as far, in fact, as the inflammation has extended, and all, or the greater part of the hairs fall out in a comparatively short time. Such a rapid general shedding of the hair is usually designated as *Defluvium capillorum*. This result of eczema, psoriasis, or erysipelas, belongs to the unpleasant events which have already been noted in the description of those diseases.

In these cases, we must be the more prepared for a *defluvium capillorum* to occur, the more the inflammation has affected the deeper layers of the corium and the subcutaneous tissue, and the longer the process itself continues. The more superficial the disease is, and the more rapid its course, so much the more, probably, will the patients escape loss of hair.

The alopecia which arises in connexion with the inflammatory processes mentioned is, as a rule, of a transitory character. After a cure has resulted, a more or less perfect growth of the hair again usually ensues.

Its *treatment*, therefore, coincides with that of the inflammatory process itself, and will be discussed, in part, later.

The genesis of the *Defluvium capillorum*, which arises under the influence of certain exhausting general diseases, is at all times less clear. After typhus, the puerperal state, considerable loss of blood (anæmia), &c., the hairs of the head occasionally fall out in great quantity: at first, there is only a scanty growth of hair, and then baldness results. For the most part this occurs only during convalescence from these diseases.

In these cases, also, the alopecia, as a rule, is only transitory, inasmuch as with advancing improvement in the state of the general nutrition, a vigorous growth of hair again takes place. It may be, that under the above circumstances the lowered state of the general nutrition, alone, is sufficient to cause the *Defluvium capillorum*, and that here, also, the alopecia is produced by a trophoneurosis. The experiments of Magendie* have a direct bearing on this question. He fed dogs exclusively on cheese, for a long period, causing the hair to fall off, but not causing the death of the animals. If such a mode of causation is allowed to be not improbable, it must also not be overlooked that in anæmic conditions, in chlorosis, in convalescence from severe diseases, an excessive formation of scales arises, a *seborrhœa capillitii*. The latter condition is, moreover, as I shall discuss at length in the next chapter, a very frequent cause of *Defluvium capillorum*. It is, therefore, quite allowable to consider that in the above mentioned anæmic conditions the alopecia is caused by the *seborrhœa*. As this vanishes in the course of the progress of the convalescence, so also the loss of hair comes to an end.

Similar reasons lead me to attribute the baldness which gradually develops in cachexia from carcinoma, tuberculosis, cirrhosis of the liver, &c., to *seborrhœa* of the scalp, which is to be regarded as of the same character as the fatty, glistening scaliness which develops on other parts of the body in such patients, and which is named *Pityriasis tabescentium* (Hebra). In these cases, however, the alopecia, naturally, does not disappear as long as life lasts, because the *pityriasis* remains steadily persistent.

As I have just now indicated, *seborrhœa* of the hairy scalp, *seborrhœa capillitii*, especially *seborrhœa sicca* (Hebra), which is described by many old and modern authors also as *pityriasis capitis*, is one of the most frequent causes of premature baldness. On account of this mode of causation and its frequent occurrence, this form of *Alopecia præmatura* may be designated simply as

Alopecia Furfuracea.

Symptoms, Mode of Development, Progress.—The symptoms of the chronic *seborrhœa capillitii* and those of the gradually

* Joh. Müller's 'Physiologie,' 4 Aufl., 1 Bd., p. 397.

increasing loss of hair, form, jointly, the characteristics of Alopecia (præmatura) furfuracea.

In the first period of the disease, the symptoms of the seborrhœa are alone noticeable. The hairy scalp, especially in the region of the vertex, less so on the temples, and least of all on the occiput, is covered with an immense quantity of thin, white, asbestos-like, glistening scales. They are in a state of perpetual desquamation and regeneration, and cover the hairs as if with a fine, bran-like dust. On combing or brushing, or even spontaneously, the scales fall off in great quantity. Still, however, the larger part always remains partially clinging to the scalp. By washing with soap, especially potash-soap or yolk of egg (a well known popular remedy), these scales also may be removed. The skin then appears white and smooth, being nowhere deprived of its epidermic covering (not weeping), occasionally being somewhat reddened and glistening. After some hours, however, the white scales above described become reproduced, and are found in process of separation at their borders.

This condition may persist for months or years without marked alteration. Occasionally, if the state of the head has been very much neglected, the scales become collected into large, white, chalk-like, easily crumbling masses on the vertex, where they stick fast to the hairs. Now and then, the scales are more of a yellowish-brown colour, like whey-cheese, and feel more fatty. As the dust in the air can easily adhere to these, they also become of a dirty-brown or black colour.

The patients occasionally experience slight itching sensations on the scaly parts.

This condition is met with as an almost invariable symptom of chlorosis in females and in males. These patients are also peculiarly liable to cold hands and feet, to cold perspirations in the palms of the hands and in the soles of the feet, to slight degrees of acne rosacea (bluish-red, cold tip of the nose), possess a predisposition to chilblains on the fingers and toes, and have an imperfect digestion. In women, scanty or too abundant menstruation, and chloasma uterinum are also met with. Sterility, pregnancy, and parturition often give rise to the consequences mentioned, and, therefore, also, to seborrhœa.

According to this latter statement, the seborrhœa of the hairy scalp in question is peculiar to persons in the middle

periods of life, arises during the years of puberty, frequently for the first time between the ages of 20 and 30, and persists for many years in males as well as in females. From the fortieth year and onwards the disease usually ceases.

Though annoyed by the symptom of the copious formation of scales, by the occasional itching, and the persistence for years, yet the seborrhœa but seldom causes the individuals suffering from it to apply for the assistance of the physician with any degree of urgency.

As the disease progresses, however, there is added to the seborrhœa another very distressing symptom—the *Defluvium capillorum* and, later, baldness.

The patients notice, first of all, that a remarkable number of hairs fall out on combing. Then, that even without combing, in the course of the day, many hairs fall out of their own accord. And, lastly, after the lapse of from two to six years, in association with the persistence of the abundant formation of scales on the head, and the copious shedding of the hair, that the growth of the hair is gradually becoming thinner, and at first thinly covered, then bald patches make their appearance on the head.

As a rule, the greatest loss of hair occurs at the central part of the top of the head, an inch behind the anterior (frontal) border of the hair, and the neighbourhood of the vertex, so that at first two separate, thinly covered, and, later, bald patches make their appearance, corresponding to these localities. The hair at the anterior part, in the neighbourhood of the forehead, remains unaffected for a very long time, and by the disappearance of the hair from the crown of the head, forms a gradually decreasing anterior fringe to the baldness, which, by the confluence of the two originally distinct, circular patches, has by this time become one large bald patch, occupying the whole of the middle portion of the top of the head.

Now and then, the loss of hair spreads from the frontal border onwards at the same time as the thinning on the vertex, so that, at the conclusion of the process the baldness reaches without interruption from the forehead upwards, as far even as behind the vertex, and is only bordered by the lateral and posterior growth of hair, in a form which would correspond with the ophiasis of the older authors.

The scalp from which the hairs have fallen out appears

white, smooth, shiny, is occasionally tightly stretched over the bony eminences and the sutures, has a pinkish gloss, is pinched up with difficulty, and thinned. It is scarcely ever completely bald, at least not during the first few years of the existence of the baldness, for, numerous, fine, and short, very slightly pigmented, lanugo-like hairs are still always present. It is only after many years that the latter also cease to exist.

These symptoms, taken together, will account for by far the greater number of cases of premature baldness occurring in men and women. For this reason I will discuss, at somewhat greater length, the morbid process which lies at their foundation.

If we turn our attention to the circumstances which govern the normal condition of the growth of the hair, they will appear of essentially the same character as those which relate to pathological conditions.

Every individual hair has a definite duration of life apportioned to it from its origin.* This may be named the physiological duration of life of the hair, which may vary according to its position, and the age and state of health of the individual. When the hair has reached the end of the physiological term of its life, it falls out and is replaced by a new one, which is developed either in the old follicle from the existing papilla, or from a growth of cells originating in the neighbourhood of this (Heusinger,† Kölliker‡), or from a lateral pouch in connexion with the old follicle (Steinlin§) from a papilla newly formed there. The thicker the hair, the longer will its term of life be, *cæteris paribus*, and the greater will be its length, also,|| and *vice versâ*. Thus, a normal hair may have a duration of one year or more, whilst the hair of the same follicle may, pathologically, have its term of life reduced to three months or less.¶

In the same proportion as the physiological term of life

* Donders im 'Archiv für Ophthalmologie von Arlt, Donders und Græfe,' iv. B., 1 Abth.

† Meckel's Archiv, 1822, p. 557.

‡ 'Mikroskopische Anatomie,' Leipzig, 1850, p. 143 et sequ.

§ Steinlin, 'Zur Lehre von dem Baue und der Entwicklung der Haare,' Henle und Pfeuffer's Zeitschrift, ix. B., p. 288 et sequ, Taf. viii.

|| Pincus, Virchow's 'Archiv f. path. Anat.,' &c., 41 B., 1867, p. 324.

¶ Ibid., loc. cit., 37 B., 1866, p. 39.

of a hair becomes shortened, its length and thickness are diminished.

The hairs which are present on one and the same tract of skin, for instance, that on the back of a phalanx of a finger, differ essentially from one another in age (stage of development) and thickness, and, therefore, also in their term of life and in their length. The point of time at which the term of life ceases never coincides, therefore, for the individual hairs of the same cutaneous region, and an interval equal to one-fourth of the term of life of the shorter hairs (consequently a period of from three to five weeks for the hairs on the backs of the fingers) elapses, as a rule, before the hair which has fallen out is replaced by a second.*

The constancy of the growth of the hair, that is, of the number (density) and of the length of the hairs, depends, therefore, on the regular maintenance of the conditions of the physiological term of life and renewal of the individual hairs.

Any disturbance in these conditions of such a nature that the physiological term of life of the individual hairs is shortened, entails, as a consequence, that the physiological renewal of the hair suffers a disturbance, and, therefore, the growth of hair gradually becomes thinner. As, at the same time that the term of life of the hairs becomes diminished, the individual hairs also become shorter and thinner, an indication is furnished of the way in which a marked loss of hair, and, finally, baldness may be produced.

If we follow out this indication in our discussion of the subject, we shall arrive at a better understanding of the processes which lie at the foundation of alopecia præmatura ex seborrhœa.

Pincus, of whom mention has already often been made, has investigated, more carefully than anyone else before him, the changes which occur in the conditions of the growth of the hair in the disease in question, and has recorded the results of his observations, on which he has expended so much time and trouble, in the 'Archiv für pathol. Anatomie, Physiologie und klinische Medizin,' and particularly in Band. 37, 41, 43, 45, &c. He has not succeeded in arriving at "universally applicable" rules as to the conditions under which the alternation of

* Pincus, loc. cit., 41 B., p. 324.

the hair occurs. Much that is essential still remains quite obscure to him; certain things may not have, exclusively, the precise meaning which Pincus is inclined to attribute to them. His works, nevertheless, contain such a collection of positive data bearing out previous clinical experience, that they are worthy of very great consideration. He distinguishes two stages of the disease; of these, the first is indicated by the excessive formation of scales on the head; the second, by the clinically evident loss of hair. The formation of scales is regarded by him, as by many of the older authors (Willan, Gibert, and others) as a pityriasis, and he, therefore, names the disease Alopecia pityrodes. Hebra's designation of this condition as *Seborrhœa sicca* (Atlas, iii. Lieferung, Text) does not seem to him suitable, though he himself says that the scales of Pityriasis capitis, after having been treated with ether, consist of the diseased products of the secretion of the sebaceous glands to the extent of the greater part (three-fifths) of their weight.

Supported by this observation, and by Hebra's* statements respecting seborrhœa, and by my former explanations, I must insist on the seborrhœal character of the formation of scales lying at the foundation of alopecia, and I hope to meet Pincus' terminological doubts by proposing the name Alopecia furfuracea.

NOTE.—Hebra (Atlas, iii. Lief., Text) defines seborrhœa as a morbid secretion of epidermic masses impregnated with sebum, occurring in the form of a greasy coating, or consisting of accumulations of scale-like masses on a part of the skin which is, in other respects, healthy.

He reverts to the characters of the disease already mentioned by Plenck ('Doctr. de morb. cutan.' edit. ii., Viennæ, p. 86), who says: *Porrigo farinosa s. Spuria est congeries materiæ unguinosæ pulverulentæ . . . quæ crustam sordidam atque fœtidam sub pectinæ farinæ crassæ formâ delabentem constituit. Materies hæc farinosa v. furfuracea humor sebaceus glandularum capitis esse videtur.*

Hebra distinguishes a fatty seborrhœa (*acné sebacée fluente*, Cazenave)—*S. oleosa*, s. *adiposa*, and a dry, scaly seborrhœa—*S. sicca*, s. *squamosa* (Cazenave, *Acné sebacée sèche*). The latter is characterised in a few cases by the sebaceous secretion appearing in the form of dirty-white or pale-yellow flakes resembling dried meal-pap (Taf. viii., 1, iii. Lief., d. Atl.), which are moderately firmly attached to a normally coloured or slightly reddened cutaneous surface, and which, on being purposely detached, show small, needle-shaped processes (sebaceous

* See vol. i. present work, p. 104, &c.—Tr.

plugs, comedones) on their under surface, that next the skin. These processes were inserted into the dilated orifices of the sebaceous glands. In other cases, on the contrary, we find that the dried sebum appears to be accumulated, in thinner or thicker layers, on a part of the skin having a normal appearance, in the form of white, bran-like scales, which may not only be easily detached from the skin by scratching, but, also, may fall off spontaneously in the form of a mealy dust. According to this description, Hebra's *Seborrhœa sicca capillitii* is equivalent to the *Porrigio furfuracea* of Plenck (*loc. cit.*), to the *Pityriasis capitis* of Willan (*Delineations of Skin Diseases, &c.*, plate xv., and '*Die Hautkr. und ihre Behandlung nach*,' Deutsch v. Friese, Breslau, 1799, 1 B., p. 138, pl. xvii.), Gibert (*Traité pratique, &c.*, Paris, 1840, p. 297), to the *Tinea s. Porrigio, s. Pityriasis amianthacea, s. asbestina* of Alibert ('*Monographie des dermatoses*, Leipzig, 1837, 1 Th., 365 and 367, and '*Description des maladies de la peau*,' par Alibert, Paris, 1814, p. 7, pl. iii., p. 9, planche iv.), and to the *Teigne amiantacée et furfuracée* of Mahon ('*Recherches sur le siège et la nature des teignes*,' Paris, 1829, pp. 145 and 179, planche iii., figs. 2 and 3).

Pincus has arrived at an accurate estimate of the amount and the nature of the daily loss of hair in the first stage of alopecia, in that of the *seborrhœa*, by calculation. For this purpose, he has availed himself of certain peculiarities presented by the hairs.

The hairs on the scalp in men either do or do not show traces of the scissors. Those which do not he calls pointed hairs. According to the usual mode of dressing the hair in men, in whom the hair is generally worn about two inches or more in length, there is a constant relation between the pointed hairs and the total number which fall out. In women, Pincus has taken the short hairs as the analogues of the pointed hairs in men.

The pointed hairs have a shorter length and a shorter term of life (four to nine months) than the rest (two to four years), and they are supplied in great part from the borders of the hairy scalp. In a state of health, the minimum of the daily loss, in the cases observed, ranged between 13 and 70, the maximum between 62 and 203 hairs.

The development of alopecia is characterised, according to Pincus, by the fact that the relative proportion of the pointed hairs to the total number shed is essentially increased, without the absolute amount of the daily loss of hair markedly exceeding the normal limits. The average numbers of the hairs lost daily in a state of health, and in patients affected with alopecia, lie, therefore, within the same limits (?). Whilst, however, normally,

the proportion of the pointed hairs shed, to the total loss, may be represented as 1 in 18, it increases in alopecia to 1 in 8, or even, in the second stage of alopecia, to 1 in 2.

The first stage of alopecia, therefore, is characterised by the fact that, at first, a slight, but, afterwards, a considerable number of hairs gradually suffer diminution both in their length and in their term of life.

The latter circumstance, which has been previously mentioned, and is here expressed in another form, would of itself show that the hairs are shed before the proper time. This would not, however, alone, lead to baldness, as may be easily understood, but, at the most, only to the production of short and thin hairs. If baldness finally result, then, at the same time with the changes which have been described in the growth and in the physiological shedding of the hair, there must also exist a disturbance in the regular reproduction of the hair. At this point, we arrive at the proximate cause of the alopecia—at the seborrhœa. This results primarily from an excessive excretion of cells by the sebaceous glands. In association with this there will naturally be a more abundant production of the cells of the sebaceous glands, and undoubtedly an organic chemical change in them, which may be more specially designated as a fatty impregnation. The cells of the outer root-sheath, which correspond to the constituents of the rete mucosum, are continued, without interruption, into the sebaceous glands, the walls of which are everywhere lined by them—analogous to the enchymatous cells of other glands. If the cells of the sebaceous glands become diseased in the manner mentioned, and are thrown off in excess, it is but natural to suppose that the same process of separation and shedding must also, in course of time, attack the prolongations of these cells into the root-sheaths of the hairs. In consequence of such a change in the nutrition, and such a mechanical separation of the elements of the latter, the hair must also be shed. Indeed, Kölliker, Heusinger, &c. (*loc. cit.*), even explain the physiological shedding of the hair in this way. Here, however, we have only to deal with a transitory hyperplasia of the cells of the root-sheath.

If the hyperplasia of the cells diminishes, they become more stable, and a new hair may be formed. They may either then simply nourish a new hair formed from the papilla, or they may

themselves undergo transformation in their central portion into a hair (Kölliker). This return to a regular production of hair actually occurs even in very advanced stages of Alopecia furfuracea, and in a degree of perfection, too, which leaves nothing to be desired.

If the seborrhœa and the defluvium capillorum have persisted for six, or eight, or ten years or more, and if, during that time, the reproduction of new hairs has been in abeyance, then, usually, a return to the normal condition is not at all probable, and, at length, is no longer possible. When the process has continued for such a long time, the papillæ and their vessels must have become so changed (atrophied*) that they are no longer capable of producing new cells† for the formation of a young hair-bulb. The baldness then becomes permanent.

A conception of Alopecia furfuracea as a substantive process, which, in fact, it is, can only be arrived at on the basis of such a consideration of the elementary processes connected with the normal growth of the hair and the anatomico-physiological circumstances connected with the alternation of the hairs. The first step in the process is the abundant formation of scales (seborrhœa); after some months, this is accompanied by a copious shedding of the hairs; the growth of hair appears thinner, because, in the first place, finer and shorter hairs, and, later, only downy hairs take the place of the former ones; and, lastly, these fall out copiously, and the more quickly, inasmuch as the finer the hair is, the shorter is the term of life it possesses physiologically. Finally, the formation of hair is reduced everywhere to a minimum—the scalp becomes bald.

Though Pincus wishes to distinguish a second stage of alopecia (pityrodes), the transition to the latter symptoms is imperceptible. This is admitted by Pincus, since he adds, in contrast with the account of the first stage, that the absolute shedding of the hair increases with the progress of the malady

* Steinlin (loc. cit.) shows that this occurs even in a normal condition, and attributes the origin of the medullary portion of the hair, containing air, to atrophy of the vessels and of the papilla (Pulpe).

† The soft cells of the hair-root, which are continuous in their peripheral portion with the layer of cells of the outer root-sheath, are developed on the spot. (See Kölliker, loc. cit., u., p. 129, Syd. Soc. Tr., vol. i., p. 188; v. Biesiadecki, in Stricker's 'Handbuch der Lehre von den Geweben,' iii. Heft, 1870, p. 600. Stricker, New Syd. Soc., vol. ii., pp. 249, 256, &c.)

(Archiv, 41 B., p. 329), so that, whilst in the earlier stage of alopecia, the average loss amounts to 76 (hairs) daily, in the later stage, it gradually increases to 300. The data, however, which he furnishes respecting this "stage" are very exact, and analogous to those which I have given. That is to say, that the diameter (thickness) of the individual hairs is diminished; that, therefore, by degrees thinner and, at last, lanugo hairs are formed, and that, finally, the latter fall out in great quantities—in short, that permanent baldness gradually results owing to a limitation in the growth of the hair both as to quantity and vigour.

Anatomy.—In the preceding account, the essential anatomical conditions have been explained as far as they throw any light on the process of Alopecia furfuracea. I need only mention, further, that in the more advanced stages of alopecia the hairs can be extracted very easily; that, as a rule, the root-sheath comes out more or less completely with the hair when it is extracted, and is occasionally inverted, as I have particularly noted in treating of Alopecia areata, and the hairs which have fallen out, especially in the later stages, appear atrophied, *i.e.*, at the root. Pincus states that he has invariably found the layers of the corium of the skin itself also atrophied.

Prognosis.—If we bear in mind the nature of the processes which lie at the foundation of Alopecia furfuracea, and the course of the latter, we shall be able to give a comparatively hopeful prognosis in the early stages of the disease, and also so long as hairs are still reproduced, though they may be but downy hairs. At this period, a "stronger growth of hair," in the literal sense, is always possible, that is, the hairs may become thicker and longer, and may last longer—in fact, the growth of the hair may be restored in its normal condition. When once the formation of hair has become checked at many parts, when baldness has made its appearance, there is usually but little prospect of recovery for these parts in particular. As a rule, recovery may be expected during the first four or eight years of the existence of the malady (which, moreover, is only first noticed, for the most part, at a late period), as the result of appropriate treatment or the spontaneous cure of the disease.

Etiology.—I have already enumerated, in great part, at p. 222, all the causes, both external and constitutional, which

may give rise to *Seborrhœa capillitii chronica*, and, consecutively, to *Alopecia furfuracea*, and which may be arranged under the three heads of *Chlorosis*, *Anæmia*, and *Cachexia*.* I do not agree with the opinion of many pessimists who consider that later generations have been more subject to premature baldness than the members of preceding generations; but, that the *Alopecia prematura* above described is of sufficiently frequent occurrence is an unmistakeable fact. A glance from the box of a theatre at the heads of the audience below (in the parterre) reveals a "parterre of bald heads." At the same time, we learn also that men are much more frequently affected than women. This is true, notwithstanding the fact that the latter have better opportunities of concealing any bald patches by skilfully dressing the hair. Not only is the disease actually less common in women, but also the baldness is not usually of the same extent as in men. It is, for the most part, confined to the middle line of the top of the head corresponding to the sagittal suture, and is characterised by the "parting" (caused by dressing it) of the hair (that is, corresponding to the middle line of the top of the head) becoming unusually broad.

It remains somewhat mysterious why this kind of alopecia should occur with so much greater frequency in men than in women, as, on the other hand, the symptoms of chlorosis undoubtedly occur with much greater frequency, and in a more marked degree, in the latter than in men, and in them, after the period of puberty, during pregnancy and the puerperal state, many more opportunities are afforded for the development of chlorosis. Even if we admit that the chlorosis of females yields to appropriate treatment, we do not arrive at any explanation. For there are very many women, particularly among servants, who suffer for many years from a high degree of chlorosis, without having received any treatment whatever for it, and who, nevertheless, remain unaffected with alopecia. Nothing else remains but to be content with the scanty results of experience, and not to overlook the fact that our conception of chlorosis does not admit of exact definition, but corresponds to a sum-

* It is quite incomprehensible how Pincus, after having so strictly distinguished *Alopecia "pityrodes"* from *Alopecia eczematodes*, *rheumatica*, &c., should consider "a chronic eczematous or impetiginous eruption on the scalp" to be the cause of the same alopecia (vide loc. cit., 41 B., p. 352).

total of symptoms which are of a different nature in women to what they are in men. As a matter of fact, the symptoms which have been mentioned—chronic indigestion, coldness and blueness of the hands, feet, and nose, that is, a sluggish circulation in the capillaries of the peripheral parts of the body, a predisposition to frost-bites, pallor, and dryness of the skin, &c.—often occur in men who suffer from Alopecia furfuracea. In other cases, on the contrary, the Seborrhœa capillitii itself appears to be the only evidence of the chlorosis. That the etiological conditions are to be regarded in the sense represented is shown not only by what has been said, but also by the result of appropriate treatment.

Seborrhœa of the hairy scalp must also be considered as the proximate cause of another series of forms of alopecia, which have been already dwelt upon in part.

The defluvium capillorum, which is frequently developed after exhausting general diseases, such as typhus, the puerperal state, tuberculosis, carcinoma, &c., and which results either in a transitory or in a partially permanent baldness, may, certainly, in many cases be considered as the result of the lowered condition of the general nutrition, as a trophoneurosis. In many other cases, however, the loss of hair is manifestly produced by a seborrhœa, which is readily developed after such exhausting diseases, just as after anæmic conditions in general, and which, when once produced, persists as a substantive disease for months or years, causing a gradual loss of hair, in the form of Alopecia furfuracea just described.

After variola, defluvium capillorum may not unfrequently be observed. It exists in two forms. At one time, many hair follicles may become destroyed in the course of the development of the efflorescence itself, just as in acne or pustular syphilitic eruptions and other analogous affections; the walls of the hair follicles and the root-sheaths being destroyed by the suppurative processes going on in the individual pustules, and the hair-sacs becoming obliterated by cicatrisation. If very many hair follicles become sacrificed in this way, then a corresponding degree of baldness results permanently. At another time, the eruption may not involve the corium so deeply, and the hair-sacs may remain in great part unaffected. After the disappearance of the pustules, however, an affection of the sebaceous

glands makes its appearance which was originally described by Hebra as *Seborrhœa congestiva*,* and which may here and there develop into *Lupus erythematosus*.† Under these circumstances, there are formed yellowish-white, dirty, yellowish-brown crusts, having a greasy feel, and which are often piled on one another in great thickness. If we remove them, we find on their under surface, small, comedo-like, conical processes, by means of which the lamellated crusts were implanted into the openings of the sebaceous follicles. The skin itself appears somewhat reddened, of a glistening, greasy aspect, the sebaceous follicles connected with it have wide mouths, and the latter are surrounded by a reddish areola. If the skin corresponding to the latter be rubbed rather hard (in removing the crusts) it bleeds. As clinical observation and the results of microscopic examination teach us, the papillæ surrounding the sebaceous and hair follicles are in a condition of cell-infiltration, which is apparent in the form of chronic inflammation. If the skin which has been freed from the sebaceous crusts is left without further treatment, the fatty secretion becomes reproduced at once, in the form of a glistening, greasy coating, and, after from one to two days, as thick crusts.

If the seborrhœa described becomes of a chronic character, the scales lose somewhat, on the one hand, their decidedly fatty condition, they become rather dryer, and, on the other hand, they also become smaller, more bran-like, and desquamate more copiously—in short, it takes the form of a *Seborrhœa sicca* (furfuracea). And this may lead, in the course of years, to alopecia, just as an idiopathic seborrhœa of the hairy scalp may, which is quite unconnected with variola.

There is yet another kind of alopecia of a special character, which we must mention, the so-called

Alopecia Syphilitica.

This is not the place to discuss the pathognomonic significance of this kind of alopecia in regard to syphilis in general, nor its position in the series of symptoms of syphilis. I will

* Zeitschr. d. k. k. Ges. d. Aertzte, 1845, Bd. 1, p. 40.

† S. Kaposi (Moriz Kohn), 'Zum Wesen und zur Therapie des *Lupus erythematosus*,' Archiv für Dermatol. und Syphilis, 1869, 1 Heft.

only mention the fact that loss of hair and transitory or permanent baldness not unfrequently occur in the course of the disease.

This symptom was noted by the earliest writers on syphilis in the fifteenth and sixteenth centuries, and has been alluded to by modern authors under various designations (*Syphilopsiloma*, Fuchs, loc. cit., 815, *Alopécie Vénérienne*, Rayer, Atlas, Taf. 16, fig. 18).

In a general way, the loss of hair which occurs in the course of syphilis may be said to depend on disease of the part from which the hair is produced. Just as I have shown in a former account (see p. 65), the nails cannot become diseased in any other way than by a pathological change taking place in their matrix.

In the course of syphilis there are developed on the scalp, as on other parts of the integument generally, circumscribed and discrete, specific cell-infiltrations; papules, which most frequently affect the immediate neighbourhood of the sebaceous and hair follicles; or larger tubercles, gummata. The papules, and also the large tubercles, become re-absorbed, progressively, from the oldest central parts, towards the periphery, after undergoing fatty metamorphosis of their cells. In these positions, the cutis also becomes atrophied—there results cicatricial, capillary depressions, losses of skin. The sebaceous follicles and the hairs corresponding to these perish. Or, the papules and tubercles break down into well-known characteristic ulcers, which heal by cicatrization.

In both cases, however, the loss of hair entirely corresponds with the individual local infiltrations and ulcerations, just as in acne, sycosis, variolous pustules, &c. In one word, such affections never produce any widely diffused and symmetrical loss of hair. The latter, which represents the alopecia peculiar to syphilis, just like the non-syphilitic *Alopecia furfuracea*, is also produced by seborrhœa of the hairy scalp. This seborrhœa arises occasionally during the existence of a maculated or papular syphilide on the hairy scalp, and therefore in the early stages of the general syphilitic affection; or it may not be developed till a later period, when the early symptoms of syphilis have disappeared, often, indeed, at a time when no further symptoms of syphilis whatever are to be discovered on

the skin, on the mucous membranes, or in other structures. The seborrhœa, at its commencement, partakes rather of the character of Seborrhœa oleosa, since large, dirty, yellowish-brown, fatty crusts are formed, and it is only after longer duration that drier, asbestos-like scales are met with—Seborrhœa sicca. The seborrhœa does not disappear with the involution of the rest of the syphilitic symptoms, but persists, most frequently, for months and years, as an independent disease, having the same character and the same consequences as the Seborrhœa capillitii non-syphilitica. The loss of hair originates in the same way as in the latter, and attacks, also, more particularly, the central part of the top of the head. The progress of the syphilitic alopecia is, as a rule, more acute, just as the seborrhœa in this form is developed more rapidly and more severely than in the idiopathic form.

As, therefore, I refer syphilitic alopecia, in accordance with the clinical data, to seborrhœa of the scalp as its proximate cause, it is, at the same time, inferred that it cannot be the result of the employment of mercury, as has been too often asserted by some who certainly are not very competent to form an opinion. There is scarcely any symptom of syphilis which has not been attributed in one quarter or another to the use of mercury. As, however, in cases in which syphilis has been treated quite independently of mercury by means of decoctions of various woods (decoct. guaiaci, radiceis sarsaparillæ, &c., in the sixteenth century), after the plan of Broussais' school (in the preceding century), and by means of iodine (within the last forty years), opportunity has been afforded for demonstrating the fact that even without the use of mercury the well known symptoms of syphilis are developed, and also that the seborrhœa and its result, the alopecia, arise independently of the use of mercury.

Prognosis.—From the account which has been given of the progress, as well as of the cause of Alopecia prematura symptomatice, it will have been evident, to a great extent, and has been already here and there hinted at by us, under what conditions the baldness is permanent or admits of cure owing to a renewal of the growth of the hair.

In a general way, it may be said that the more the hair follicles are destroyed in consequence of the primary disease, so

much less is the possibility of there being any reproduction of the hair; and that the greatest chances of a fortunate result are afforded by the cases in which the loss of hair is due to a more congested or inflammatory condition of the hairy scalp. Those cases are unpromising, therefore, in which there are many and deep scars to be seen on the bald patches, as a result of a deeply destroying variola, acne varioliformis, ulcerating syphilides, lupus vulgaris, lupus erythematosus, &c.

The most hopeful cases, on the contrary, are those in which the alopecia has followed eczema of the hairy scalp, psoriasis, erysipelas, and seborrhœa—non-syphilitic and syphilitic. In regard to the latter, it remains to be noted that a cure may be expected all the more, in proportion to the rapidity with which the primary affection has yielded, spontaneously, or as the result of appropriate treatment. In Alopecia furfuracea, which progresses very slowly, a complete or comparative cure may be possible after it has existed for four or six years.

Treatment.—Generally, it is the Alopecia furfuracea itself which causes the patient to seek advice. The patients come under care usually on account of the baldness merely; they are anxious, in the first place, to check the excessive shedding of the hair, and, secondly, to cause fresh hair to spring up on the bald patches. It is but rarely that the copious formation of scales has attracted attention. Least of all, however, have they any suspicion of the causal relation which exists between the latter and the loss of the hair. For this reason, medical advice is only sought at a late stage, as a rule, when the hair has already become manifestly thinned, after the disease has existed for some four or six years. Our efforts must chiefly be directed against the seborrhœa. With the cure of this, the alopecia is often partly or wholly curable—but without it, never. The remedies which may be employed against the Seborrhœa capillitii are either

- (1) Local; or,
- (2) Internal.

(1) *Local Treatment.*

In the first place, the accumulations of scales on the scalp are softened by means of oil and removed by washing. A sufficient quantity of pure olive oil (Provencer Oel) is carefully

rubbed into the scalp, where covered with scales, by means of a small piece of sponge or a piece of flannel, and the head is then wrapped up in a hood of flannel. This plan is most conveniently carried out at night. If the scales are very thick and dry, the oil must be rubbed in energetically every two or three hours. After this procedure has been carried out for twelve or twenty-four hours, the scales become so brittle that they may be broken up and removed with the finger. This is the time for washing the head. For this purpose any of the better kinds of soap may be made use of. A solution of soap in spirit answers best of all, because both the soap and the alcohol dissolve the fat, and the latter also slightly stimulates the sebaceous glands, and, therefore, acts as a direct method of cure as well as a merely preparatory one. Hebra's spiritus saponatus kalinus, mentioned at p. 36, vol. ii., is the most effective. It is prepared by digesting soft soap in half the quantity of highly rectified spirit of wine for twenty-four hours. This is then filtered and the solution scented by the addition of spirit of lavender.

A sufficient quantity of the alcoholic solution of soap is sprinkled on a piece of flannel, or on a coarse-meshed ("French") sponge, and the scalp is then washed with it. By dipping the piece (of flannel) from time to time in lukewarm water, owing to evaporation of the alcohol, the soap adheres to the hairs in abundance. By the occasional addition of water a lather is formed, just as if any other of the more commonly used sorts of soap had been employed. After the scales and crusts have been everywhere thoroughly removed from the scalp, the hairs are rinsed with cold or lukewarm water until it flows away quite free from mixture with soap. Instead of merely pouring cold water over the head, it is preferable to employ the cold douche. The whole procedure of washing with soap and of douching with cold water may be conveniently carried out by taking a vapour bath. By this plan, not only, on the one hand, do we obtain the emollient influence of the warm steam on the scales, but also, on the other hand, the slightly stimulating effect of the cold douche on the scalp tends to effect the desired cure. The inunction with oil only requires to be repeated during the first few days—as long as the sebaceous crusts are reproduced in excessive quantity and density. The process of

washing and douching above described, however, must be persevered in day by day, most conveniently at night, in men as well as in women. After the completion of the washing, the hair must be combed, and by this means some scales still remaining may be removed. The hair is then left quite unrestrained, that is, in women it is not plaited nor arranged in any way. It must remain uncovered in order that it may dry thoroughly.

For the first few days, the patients lose a very large quantity of hair, much to their dismay, during the washing and combing, so that they appear much more bald than they did before commencing the treatment. It is necessary to call the patient's attention beforehand to this unavoidable but very easily explained circumstance. There are many hairs, for instance, whose roots are already atrophied, and whose root-sheaths are already loosed, which adhere but slightly to their follicles. These, which are quite ready to fall out, are pulled out by the washing, and they are accompanied by many hairs which, though set free from their follicles, are retained by the masses of sebum. The loss, therefore, only affects hairs which would otherwise, though not at the precise time, have been shed.

At a later stage, instead of the wash of the alcoholic solution of soap, may be substituted one containing "brandy" (*Sp. vini gallicus*), or an alcoholic one containing any of the substances, to be mentioned later, in solution.

I consider the persistent use of alcoholic soaps, or of some other alcoholic wash, of the greatest importance in the treatment of Alopecia furfuracea. This, alone, is often quite sufficient to effect a cure of the seborrhœa and of the alopecia. The alcohol, however, so thoroughly removes the fat from the epidermis that it becomes dry, brittle, and a new kind of branny desquamation is developed—true pityriasis. On this account, it is necessary, each time the wash of soap and alcohol is applied, and after the hair (in from one to three hours) has become dry, to convey some fatty matter to the epidermis, by rubbing into the scalp either oil or merely lard, or some simple salve or compound pomade.

This is the general scheme according to which Alopecia furfuracea must be treated. The procedure is undoubtedly aimed at the seborrhœa as the proximate cause of the alopecia, and is efficient. It is desirable, however, to look for remedies

which, after the removal of the seborrhœa, are capable of favouring the production of hair.

With this object in view, quacks and persons engaged in trade have introduced, in former times, various medicaments and plans of procedure to the credulity of the laity and of physicians without having been favoured with any more practical result than has occurred in the case of the experiments instituted, latterly, by Pincus.*

In the first place, it has been stated that "cutting" the hair, either practised only on one occasion, or repeated from time to time, promotes the growth of the hair. It has, indeed, been ascertained, by calculation, to be a fact (Witthof) that the total length of a hair obtained by adding together the lengths of the several pieces cut off, from time to time, is greater than that attained, *cæteris paribus*, if it is left uncut. This only shows, however, that a hair which has been cut is disposed to grow more quickly. The latter phenomenon, however, does not add to the physiological term of life of the hair, on which everything depends. On the other hand, it is well known that the hair in women who possess very long hair from the time of girlhood, never again attains its original length after having once been cut. And, lastly, the cutting of the existing hair has been shown to be without any influence on the follicles which produced no hairs, or hairs which were not sufficiently thick and long, that is, without any influence on the luxuriance of the growth of the hair. Cutting the hair, therefore, affords, on the one hand, no advantage whatever, and, on the other hand, is simply a drawback, owing to the momentary, absolute, and the later, comparative, shortening of the hair. It is, therefore, to be condemned, however much it may find favour in many quarters.

As a rule, slightly stimulating and astringent, or such as are denominated, in pharmacology, strengthening remedies, are recommended in alopecia, rather on the basis of a vague theory and a desire to be doing something, than on the result obtained or the success of experiment.

The latter has been undertaken by Pincus (loc. cit.) in reference to the hairs of the fingers. He has however succeeded rather

* 'Zur Therapie der Alopecia pityrodes,' Archiv f. Physiol., &c., Bd. 43, p. 305 et sequ.

in throwing discredit on some of the remedies hitherto considered efficient than in creating confidence in them. *Oleum sabinæ* and bicarbonate of soda, which he has found most efficient, are, according to his own showing, not adapted for use. The former dyes the hair of a reddish brown and the latter renders it brittle.

If we are of opinion that slight irritation of the cutaneous glands or the use of astringents is likely to be beneficial, then we must recommend, chiefly, tannin, quinine, tincture of cantharides, veratria, in such combination and quantity that they will not irritate the scalp so far as to set up eczema or inflammation. Alcohol and ether are likewise suitable, as, by their evaporation, they irritate the skin and cause it to contract, owing to the coldness produced. We may, therefore, employ these remedies in combination with one another by using alcoholic-ethereal solutions of the same, as washes and paints for the scalp. They will act at the same time on the seborrhœa, and, as is supposed, in the manner last mentioned. A solution of twelve grains to one scruple of Tannin or Veratria in six ounces of alcohol, with the addition of some fatty matter, may be employed, such as *Rp. Tannini pur. gran. duodecim, Spir. vini rectific. unc. quinque, Spir. lavand. unciam, Ether sulfur., drachmas duas, Glycerrin. unciam semis, Olei Bergamot. gutt. decem*. To be rubbed in morning and evening by means of a brush. Or, from one scruple to half a drachm of tincture of cantharides in a similar solution, and the like.

As, after washing with soap, spirit of soap, or with alcohol, the epidermis, which has been deprived of its fat and is desquamating, must be supplied with fat from without, it is better to use such salves and pomades which contain at the same time one or the other of the substances mentioned, or similar ones in suitable proportion. Thus, the following pomade may be made up, after Dupuytren:—*Rp. Medullæ ossium uncias duas; Extracti Cinch. frigide parati drachmas duas; Tincturæ Cantharidum, Succu citri recens expressi ana drachmam; Olei de Cedro (Citro) scrupulum; Olei Bergamottæ scrupulum semis*. Another, which has been introduced into commerce with various modifications, the so-called Tanno-quinine pomade, may be prepared according to the following formula:—*Rp. Butyr. de Cacao unciam et semis; Unguent. emollient. unciam semis; Olei*

Amygdal. recens pressi uncias duas et semis, Liquefactis admisce sempit. agitatione; Sulfat. Quinæ scrupulum semis (in aliqu. guttis Acid. Sulf. et uncia semis Aquæ Rosarum soluti) dein adde; Olei Citri drachmam semis, Olei Bergamottæ scrupulum, Olei Lavandulæ guttas viginti, Tannini scrupulos duos in Tinct. Cantharid. drachma una et Aquæ Coloniensis drachmis tribus soluti. Misce exactissime. It will be seen that, practically, everything is here collected together which has ever been recommended for the purpose. Only slightly less complicated, but less elegant, is the well-known pomade sold by apothecaries as Unguentum Gemmarum Populi, which is prepared according to the following formula. Rp. Gemmarum (Resin) populi recent. contus. unciam, Axungiæ porci depurat. uncias sex, Aqu. Rosarum drachmas duas et scrupulos duos, Coque ad humidi consumptionem, deinde exprime et adde; Cereæ flavæ unciam. Liquefacta, cola et semirefrigerata agitentur addendo; Olei Citri, Olei Bergamottæ, Olei Rosarum ana scrupulum semis. Misce.

I need hardly first of all insist on the fact that these plans simply meet a frequently recurring practical need, and are of no value from a scientific point of view.

As regards the latter it must be remembered that Alopecia furfuracea is curable during the first years of its existence, if the seborrhœa which occasions it be removed, and that this may be accomplished by means of the persistent and energetic employment of spiritus saponatus kalinus and of the alcoholic-etheral fluids mentioned, and the occasional addition of fatty material to the epidermis, whenever it has become too dry.

The local method of procedure described above is, undoubtedly, amply sufficient for the temporary removal of the seborrhœa capillitii; but, in order to render this cure lasting and to facilitate the undisturbed reproduction of the hair, it is also necessary that the cause of the seborrhœa itself be removed. In the majority of the cases the disease is set up by chlorosis and anæmia. In addition, therefore, to the local treatment just given in detail, in females, besides giving appropriate directions as to nourishing diet and mode of life, we must also prescribe iron, in a form adapted to the individual case, in pills, powder, or mixture, with or without rhubarb, aloes, jalap, &c., but, in any case, it must be continued for four or six months, and even

longer, with, at most, only short interruptions. Cold, fresh-water bathing in summer and the cold water-cure are also to be recommended. In men, I have occasionally been compelled in these cases, instead of the iron, owing to the chronic gastric disturbance present, to prescribe a powder composed of equal parts of bicarbonate of soda, phosphate of soda, carbonate of magnesia, and sugar, a tea-spoonful to be taken thrice daily, dissolved in water, and continued for several weeks. Under this treatment, the gastric catarrh, the depression, the loss of appetite, indigestion, costiveness, &c., have disappeared. During the summer months suitable mineral waters or hydropathy are advantageous. A combination of iron with arsenic (*Liquor Ferro-vinoso-arsenicalis* (Wilson), and Hebra's modification) may also be recommended.

All these remedies, in addition to the local treatment, must be continued for months.

What has been said applies equally to the *defluvium capillorum*, which appears after exhausting, general diseases (typhus, rheumatism, puerperal processes, &c.), whether in consequence of a mere disturbance of nutrition, or of a seborrhœa of the scalp set up by the anæmia. As has been noted before, alopecia also results from the seborrhœa capillitii, which appears after variola and in the course of syphilis. The treatment of the two last forms of baldness is entirely identical with that of the *Alopecia furfuracea* which originates in consequence of seborrhœa from other causes. It is merely necessary to observe that after variola, local treatment alone is mostly successful, since the seborrhœa is less frequently set up by chlorosis and anæmia than by the local variolous process itself. In *Alopecia venerea ex seborrhœa*, however, I can recommend, as very effective, the application of white precipitate ointment (*Merc. precip. alb.*, $\frac{1}{2}$ —1 drachme ad Ung. emoll. unciam), in addition to the local employment of the alcoholic solutions. Constitutional antisymphilitic treatment is only advisable when, in addition to the seborrhœa, other, *κατ'ἐξοχὴν* syphilitic symptoms also occur on the skin, bones, &c. In the loss of hair which occurs in consequence of local syphilitic infiltrations and ulcerations, eczema, erysipelas, acne, sycosis, favus, lupus erythematosus, herpes tonsurans, &c., of the scalp, the only

treatment to be pursued is that appropriate to the particular morbid process itself.

B. ATROPHY OF THE HAIR CAUSED BY STRUCTURAL ALTERATION.

Atrophia Pilorum Propria.

The hairs occasionally undergo alterations in their structure, which may appropriately be termed an atrophy of the hairs themselves, since, either as a whole or in certain parts, they suffer a diminution in their physiological term of life. The hairs lose their normal condition, they become dry, lustreless, rough, brittle, cleft, and fibrillated, they swell out and break off. These changes are often met with when the nutrition and growth of the hair are interfered with by morbid processes taking place in the parts from which the hairs arise (in the follicles, the hair root-sheaths, or even in the sebaceous glands), or in the cutaneous structures immediately adjacent to the hair follicles, owing to inflammation, new-growth, ulceration, &c. These influences have been fully dealt with in the preceding paragraphs.

In such cases, the alteration in the hair is only a partial manifestation or a result of the other processes, and affects the hair, more or less, as a whole, and, principally, the youngest part of the hair, that, namely, which is more immediately exposed to the influence of the disease. The portion of hair situated beyond the hair follicle is not materially altered.

This change is more striking when a fungus invades the shaft of a hair (Trichomycosis) in Herpes tonsurans and Favus. The cortical substance of the hair is split up into fibres by the growth of the fungus, has a lustreless appearance, as if dusted over, and is brittle. The atrophy of the hair, in this case also, is only the result of the processes named, does not represent, in fact, an idiopathic affection, and will be treated of later, in describing the primary lesion.

It is also well known that the hair becomes dry and lustreless in cachectic individuals and those laid up with fever. This is partly occasioned by Seborrhœa capillitii present at the same time, or, in those affected with fever, is owing to the dryness of the skin. The hairs are hygroscopic in a high degree, and

absorb perspiration from a normally perspiring skin, whilst they also undoubtedly derive moisture—though it may be but in imperceptible quantity—from the vessels of the papillæ. Both these sources of supply are exhausted in febrile conditions, and the hairs become dry, just as the analogous horny structure, the epidermis, under similar conditions, appears dry and wrinkled.

There are only two forms of atrophic structural alteration in the hairs which we can set down, at the present time, as idiopathic, inasmuch as we cannot assign any cause for them, that is, there is not any disease to which we can attribute the change in the hair as a result.

In the first place, I will mention the well-known phenomenon of the hairs becoming split up at their extremities into two, three, or more parts. In many persons nearly all, or, at any rate, very many, of the hairs split up in this way. This cleaving of the hairs has no influence on their individual existence, nor on that of the growth of the hair generally. As this phenomenon is met with, for the most part, in long, pointed hairs (such as have not been cut), and, therefore, most frequently in women, we might explain the splitting up at the end quite easily, in this way, that this portion, owing to its distance from the papilla, receives no more moisture through the medium of the medulla, and, therefore, becomes dry, and, owing to crumbling of the uniting medium, splits up into fibres.* At all events, however, this phenomenon is of no further pathological or practical importance.

On the other hand, the alteration in the hairs, which Beigel rightly considers he has described for the first time, under the title 'On Swelling and Bursting of the Hairs,'† does represent a substantive disease. I would suggest the name *Trichorexis nodosa* for it.

We find on the hairs of the beard and moustache, exceedingly small, somewhat transparent or glistening, conical swellings. There may be one, two, five, or more, on the same hair-shaft. The little cones are placed at shorter and longer distances from

* Steinlin's (loc. cit.) opinion that the medulla of the hair is a direct continuation of the papilla affords some support to such an idea.

† Hermann Beigel, Sitzb. d. k. Akad. d. W., Bd. xvii., p. 612, 1855, Octoberheft (1 Tafel), Ueber Auftreibung und Bersten der Haare.

one another, like separate pearls on a string. On a slight examination they might be taken for ova adherent to the hair. On closer inspection it will be recognised that the little nodes belong to the hairs themselves and do not consist of adherent masses. In addition, there are also certain hairs always to be seen which have a conical node at the extremity of each, and if this occur on many hairs, on the moustache, for instance, the impression is conveyed that the hair has been "singed" by a flame and had curled itself up at the burnt end. If we pull at such a hair, we find that it is as firmly fixed as a healthy hair. It breaks off, however, easily, and invariably at the situation of such a conical swelling. The stump of hair which remains is terminated by a little node, or, more strictly speaking, by the lower half of such a one.*

As has been stated, I, as well as Beigel, have, as yet, never seen this appearance except on the hairs of the beard and the eyebrows, never on the hairs of the head or of other parts of the body. The beard is much disfigured in this way, and looks as if it had been plucked, or, rather, as if singed.

If the hairs are examined under the microscope the following conditions are found to occur with the greatest regularity.

1. A node corresponds to a simple, spindle-shaped swelling of the shaft of the hair; or

2. In the centre of the spindle-shaped swelling, the medulla of the hair itself is swollen out in the form of a spindle.

3. At another part, the node has burst in such a manner, that at the seat of the greatest curvature of the conical swelling the cortical substance of the hair has given way, and the spindle-shaped cells of the lower half of the cone project, free, upwards and outwards, whilst those of the upper half look downwards and outwards. So that they are, therefore, placed one against the other, ruggedly, like two besoms, the twigs of each of which have been thrust amongst those of the other, and whose extreme outline in section, would form a rhombus.

* It would appear that Engel has also observed this appearance, but has not quite rightly interpreted the meaning of the individual nodes, since he is of opinion that the latter are swellings which occur at the cut ends of the hairs as a kind of exudation, and that the hairs continue to grow beyond them (Wiener akad. Sitzungsab., Februarheft, 1856). That such a growth of the hair is impossible, on anatomico-physiological principles, scarcely requires detailed consideration.

4. A hair which, macroscopically, appears to be terminated by a conical swelling shows, under the microscope, a besom-like end, and this terminal splitting up represents the lower half, as described, of a conical swelling, which had previously been situated in the continuity of the hair-shaft, and at which this had broken short off.

5. The fibres of the terminal and central tufts consist of the granular spindle-shaped cells of the cortical substance of the shaft of the hair.

6. There is no trace of any fungus to be seen.

From these data, it is clear that the hairs, at first, become swollen into nodes at various parts of their course, that, later, at the seat of the greatest curvature of one of these nodes, the cortical substance bursts and, in consequence, tears apart, ruggedly, and finally breaks off at the same place, so that the lower half of the ruptured cone then remains at the end of the hair.

I cannot assign any cause for this swelling and splitting of the hair. Beigel is of opinion that gas is possibly developed in the medullary substance of the hair, which at first is itself swollen out and burst by it, and that then the cortical substance is similarly affected. However, neither he, nor I myself can speak more in detail concerning this supposed development of gas.

If we render the hair more transparent by the addition of potash, we may occasionally recognise the swelling of the medullary substance at the nodular portions. It is hard to say whether or no the medullary substance itself is increased in breadth, because it is covered by the cortical substance. I have repeatedly, however, found the medullary substance not at all increased in width at the ruptured portions.

Now and then, the medullary substance is wholly wanting in the tract of the swelling. Occasionally, under the microscope, we find a group of conglomerated, cell-like corpuscles, refracting like oil, in the neighbourhood of the nodular swelling, and which appear to have been liberated from the medullary space either by the reagent or by pressure from the covering-glass.

Certainly, everyone who investigates the occurrences described is impressed by Beigel's idea in regard to their mode of origin, as a step in advance, though it may not amount to more than a mere supposition.

The special predisposition of the individual, however, con-

tributes its share in the causation, as much as in determining the occurrence of curly or sleek hair. I must at any rate believe this after what I have already seen in three medical friends.

Beigel states that shaving the hair is the best means of removing the affection. The hairs which spring up after the shaving grow without any structural interruptions. If, after careful examination of the hairs, we have arrived at the conviction that there is no fungus present to account for their rupture, and are aware that a ruptured part can never be cured, we are led of course to try the experiment of shaying the whole beard. This is the plan, indeed, which I have adopted in all the cases which have come under my notice, amounting to about 15 in number. The hair grew again, as I had hoped, in a sound condition. My three medical friends, however, in the course of years, have repeatedly sacrificed their beards—without success. The new hairs presented nodular swellings again, burst, and broke off as before.

CHAPTER XLIV.

CLASS VII.—DIV. III.

ATROPHY OF THE NAILS.

DEFICIENCY, or a defective development of the nails occurs as a congenital affection, coincidently with deficiency or imperfection of the phalanges; and is frequently also associated with absence of the hair.

In the course of life, the nails may become thinner, smaller, narrower, or softer, or may be wholly lost, in consequence of disease, or partial or total destruction, &c., of the matrix, of the bed of the nail or of the fold of the nail, and, in fact, under precisely the same conditions which cause the nails to become hypertrophied (*vide* page 86 *et sequ*). A part of these changes, which we have discussed in connexion with hypertrophy of the nails, especially granular cloudiness of the cells, fissuring and splitting up into layers of the substance of the nail, and the formation of spaces (Virchow, "medullary spaces" (*Markräume*), *Wurzb. Verh.*, V. B. 1854, p. 91) are associated, in spite of their manifesting the characters of atrophy, with actual and apparent hypertrophy of the nail.

With regard to the development of the granular cloudiness, of the splitting up of the nail-substance into laminae, as well as of the spaces in the latter, Virchow says (*loc. cit.*): "In the first place, there appeared in the interior of certain of the horny cells, in the situation of the nucleus, fine, yellowish granules which were very closely aggregated together, and round about which the rest of the substance of the cells appeared so homogeneous that there seemed to be a cavity containing a granular mass. These cavities soon became larger. Between the cells undergoing metamorphosis, however, there were always other normal ones interposed. By degrees, the gaps became so large that they corresponded to whole cells, and it must also be noted

that the cells, during the metamorphosis, themselves became enlarged. Here and there, it happened that amongst the fine, molecular granules there occurred larger, colourless oil-globules, and, in some parts, this metamorphosis had proceeded so far that the small gaps appeared to be filled with oil-globules. This was not, however, the rule, but, rather, in most parts, the finely granular, yellowish mass persisted, and even in the largest "medullary spaces" (Markräume), usually, there was only a moderate admixture of fat, in the form of small oil-globules."

These and similar changes in the nail-substance (consisting, as a rule, in addition to diminution of the nail from behind or from the side and in thickness, also in destruction of the nail-substance, causing this to appear opaque, softened, brittle, separated into fibres or split up into laminæ) may, in some cases, affect the nail as a whole, if the matrix of the nail itself be diseased in either of the ways mentioned at p. 91. This may occur in syphilis, eczema, psoriasis, lichen ruber, ichthyosis, &c. Or, in other cases, the change may affect only a part of the nail corresponding to circumscribed disease of the matrix, of the bed of the nail, or of the fold of the nail.

Thus, at one time, the surface of the nail appears opaque, fissured, yellowish, and granular. At another time, the surface appears smooth and unaltered, whilst, on the under surface, there is a mass of detritus, which is either split up into laminæ, or is yellowish-brown, softened and dry, or somewhat moist. Or, the border of the nail, either lateral or anterior, may be the part which is altered, primarily, in one of the ways just mentioned. The opacity and crumbling may spread thence towards the posterior and central, healthy parts of the nail.

Most frequently, the latter kind of atrophy of the nail occurs from traumatic causes, the nail having been raised from its matrix, or foreign bodies having penetrated directly into the nail-substance, such, for instance, as needles, splinters, extravasation of blood in consequence of a puncture or a blow, &c. In such cases, therefore, we must regard the advance of the atrophy of the nail as of the nature of a necrobiotic process, which attacks any other tissue, such as the bones or the cutis, under similar conditions. The nail-substance, when separated from its organic connexion with the matrix or the bed of the nail, is a *corpus mortuum*, and degenerates, in the manner narrated

above, in proportion as it becomes separated from its organic connexion with the latter.

Among the foreign bodies which, having penetrated into the nail-substance or under it, cause crumbling and atrophy of it, fungi must be especially mentioned (*Favus* of the Nail, *Onychomycosis*). Their action will be spoken of in another place.

In addition to the influences named, there are also chemical ones, which may cause destruction or atrophy of the nail, in part or wholly. Thus, the nails of persons who use caustic fluids—dyers, hatters, gilders, clothes-cleaners, &c., show various changes as regards form, colour, and consistence. Even the sweat itself, by continually acting on the nail-substance, may render it soft, thin, and brittle, and the toe-nails of persons whose feet sweat much are often very soft, thin, and small. The nail may even occasionally be reduced to a zonula attached to the matrix.

The treatment of atrophy of the nails depends solely on the cause of the latter, and to this attention must be chiefly directed. In other respects, the indications are the same as in the case of hypertrophy of the nails, and we must refer to the chapter on that subject (see p. 97).

CHAPTER XLV.

(CLASS VII.—DIV. IV.)

ATROPHIA CUTIS PROPRIA.

True Atrophy of the Skin.

HITHERTO, we have been treating of those forms of atrophy which affect the horny structures of the skin, the epidermis, and the hairs, as well as the pigment which exists normally in these.

We must now discuss those atrophic conditions which concern, chiefly, the corium itself, partly as a whole, and, partly, as regards certain of its constituents. The horny structures of the skin, the hair, the nails, and the epidermis, are also involved sympathetically, but this occurs only secondarily.

Definition, Classification.—We understand by the term Atrophia cutis propria that morbid condition of the skin in which it has undergone an essential and clinically demonstrable deterioration, consisting either in a diminution of the bulk, or a change in the chemical constitution, of its structural elements.

Skin which has become atrophied, in the sense just defined, appears either thinned, in comparison with the normal skin, owing to the wasting, shrinking, and destruction of its elements—*quantitative atrophy*, its chemical constitution being also, undoubtedly, more or less altered; or, the bulk of the skin may not appear less than normal, it may be even increased in volume under certain circumstances, it merely differs from the normal condition owing to an alteration in its elements, which is of the nature of a so-called retrograde metamorphosis (degeneration), and has, in consequence, become impaired in regard to its vegetative and functional characters—*qualitative atrophy*.

The conditions last alluded to have not, however, been quite strictly distinguished from each other anatomically. Clinically,

there are other distinguishing characters partially available. Atrophy of the skin sometimes represents a peculiar, substantive morbid process—*Atrophia cutis idiopathica*; or it is only one of the symptoms, or a consequence of some other disease of the skin—*Atrophia cutis symptomatice*; and we shall treat of the disease under these two heads.

1. *Atrophia Cutis Idiopathica.*

The skin appears uniformly atrophied in all its parts, either over large tracts of the body in continuity—diffused; or the waste of tissue is only evident in the form of isolated spots and streaks—partial.

A. ATROPHIA CUTIS IDIOPATHICA DIFFUSA.

(1). *Xeroderma,* Parchment Skin.*

By this name, I shall indicate a characteristic disease coming under the designation of Atrophy of the Skin, of which I have seen two modifications. The first presented a remarkable abnormality of pigmentation, whilst, in the second form, the latter was absent.

I have only had the opportunity of observing the first kind of this undoubtedly very rare affection in two cases.†

A girl, 18 years of age, belonging to a well-to-do family in one of the northern German states, had suffered from the malady from early childhood. In the year 1863, she came under the care of Professor Hebra, and I had an opportunity of seeing her.

The skin of the face, ears, throat, neck, shoulders, arms, and of the breast, to the level of the third rib, exhibited a peculiar alteration. It was remarkable, in the first place, owing to its checkered appearance, for it appeared to be abundantly dotted over with pigmented spots of the size of pins' heads or of lentils, and of a yellowish-brown colour; it was also tightly stretched, as if contracted, was pinched up into a fold with difficulty, and

* It is necessary to mention that Erasmus Wilson has made use of the name *Xeroderma* for *Ichthyosis simplex* (loc. cit., 359), and, perhaps, has treated of the disease under discussion as (General) *Atrophia cutis*, at pp. 393, 394.

† *i.e.*, as late as 1870. Since then I have seen two others.

felt very thin. Its surface was smooth in some places, whilst in others, fine epidermic lamellæ peeled off; or, there were quite flat, linear furrows marked out on the epidermis, so that the surface appeared as dry as parchment, and wrinkled, whilst the skin itself was tightly stretched. In places, it was of a white colour and was without pigment, whilst there also existed, as has been mentioned, numerous scattered, punctiform or lentil-shaped, yellowish or dark-brown, pigmented spots resembling those of freckles. Here and there, could be seen a bright red teleangiectasis of the size of a pin's head or of a lentil. The subcutaneous fatty tissue was not markedly diminished. The skin felt rather chilly. Fine, downy hairs could be distinctly recognised on the diseased skin. The sensibility was not diminished. Beyond a sensation of tightness, the patient had no pain and no sense of itching. At the level of the third rib, and at the upper third of the arm, the alteration in the condition of the skin ceased with an almost abrupt line of demarcation. From thence downwards, the skin of the mammae, of the whole trunk, and of the extremities was quite normal, smooth, pliant, fine. The general state of the health and of the menstruation was normal.

In addition to the parchment-like dryness, thinness, and wrinkling of the epidermis, the checkered pigmentation, and the small dilatations of the vessels, the most remarkable symptoms were the contraction and, at the same time, thinning of the skin. In consequence of the first, the lower eyelids were drawn downwards; on the left side, this was so considerable that the eye could not be closed. As a result, the cornea was ulcerated, and rendered opaque in its lower half, which was always uncovered. The nose, towards its tip, appeared compressed, owing to the shrinking of its skin, and the external ears at their free extremities appeared indented here and there owing to the shrinking. The lips could only be slightly separated from one another.

I have been informed by two medical men who attended her, that she died of dropsy, resulting from cancer of the peritoneum, in Sept., 1872.

The second case which came under my observation was that of a girl 10 years of age, who had also suffered from the disease from her earliest childhood. The child had attended Professor Hebra as a private patient, and thus came under my notice

a year before, and now presented herself a second time for treatment. In this child, when first seen, the skin of the face, as far as the sub-maxillary region, and that of the extensor surfaces of the arms and hands, showed the checkered pigmentation described. The epidermis, especially on the eyelids and on the cheeks, was wrinkled and shrivelled, the upper eyelids being in consequence drawn somewhat downwards, and the lower ones drawn downwards and everted (ectropion), the eyes, therefore, seeming, from above, too small, and from below, incompletely covered. In the same way, the oral and nasal apertures were somewhat diminished. In addition, the skin was moderately tense, and was less readily than normally pinched up into a fold, but this could always be accomplished. The subcutaneous layer of fat was not altered.

In August of this year (1870) the child again came under care. The condition of the skin had not materially changed. The nose, however, was occupied by a pear-shaped, red, granulating, fissured tumour secreting an offensive, sanious fluid. It began by a broad edge at the margin of the nares, and involved the alæ and middle line of the nose symmetrically, and at a distance of about three-quarters of an inch, gradually dwindled away towards the root of the nose, reaching close to the two inner canthi. We recognised the growth to be an epithelioma, and destroyed it in great part. There remained, however, a perforation at the lower border of the right triangular cartilage. On the left cheek and on the left side of the upper lip there was a hyaline, fissured tubercle of the size of a pea.*

Erasmus Wilson describes (loc. cit., 393, 394) a similar affection under the name of "General Atrophia cutis." The cases related by him showed a still more severe form of the disease. Concerning a Mrs. L., whom Wilson saw, he writes: "Her skin was so contracted that it appeared too small for her body. Her lower eyelids were drawn downwards, so that from below the eyeballs appeared unusually exposed, her features appeared

* The subjects of the *third* and *fourth* cases were two sisters, aged 8 and 6 years respectively, who came under care in Hebra's Clinic. The disease attacked the face and extremities in both, and was said to have existed since the age of twelve months. One large *sarco-carcinomatous* node, and several small ones, became developed on the nose and eyelids of the elder girl during her stay in the Hospital.

lengthened, and the lower lip had fallen away from the mouth, showing the teeth and gums. Her fingers were bent and contracted, and there were several sore places upon them." The patient died a year after Wilson had examined her. He also remarks (p. 393) that sometimes ". . . the fingers and toes are shrunk, pointed, white, and not unfrequently ulcerated at the tips. The process is so gradual that the ends of the last phalanges make their appearance beyond the skin without much previous pain. The bone crumbles and comes away, and, after a while, a fresh piece is protruded until an entire phalange may be expelled through the opening." The small, scattered teleangiectases are also mentioned by him.

I have no more to say respecting this peculiar disease than what I have already stated, as Hebra's and my own observations are limited to the four cases already mentioned, and, so far as I am aware, with the exception of Wilson, no one else has reported any similar ones.

We must not omit to call attention to the fact that the symptoms described recall to mind very vividly the disease *Scleroderma adultorum*, already treated of at p. 104 et sequ, that is, more especially, the atrophic form of scleroderma, which follows on the preceding sclerosis as a later stage of the disease, and which has been named by Wernicke, *Cicatrising Sclerema of the Skin*. I believe, however, that the two processes should be distinguished from each other. Those who have once had an instance of the disease itself under observation must be fully impressed with the difference, however much certain of the symptoms of scleroderma and of xeroderma may seem to be common to the two. The most important difference consists in the fact that in scleroderma, the tense, contracted skin feels, at the same time, of board-like hardness, rigid, as if frozen, or like marble, and that the epidermis is smooth, for the most part; whilst, in xeroderma, the moderately tense skin never feels so rigid and hard, but, rather, remarkably thin, and the epidermis appears dried up, parchment-like, and wrinkled. Moreover, in xeroderma, there is never such an immobility of the affected skin to be detected in the face, for instance, as is characteristically the case in scleroderma. Besides, in scleroderma, in the course of years, a change occurs in the symptoms which is not the case in xeroderma, and, finally, as regards the latter, there is the

peculiarity of its development at the earliest period of childhood—if it be not actually congenital.

The *course* and the *development* of the two processes seem to distinguish them in a marked degree from one another. In scleroderma, the disease commences, as I have shown (*loc. cit.*), as a board-like infiltration of the subcutaneous connective tissue. The corium itself only appears to be involved later, and in certain parts merely; the epidermis not in the least, or, if so, at any rate only in the later periods of the disease. In xeroderma, the morbid changes, the shrinking, the atrophy, appear to begin in the papillary layer and the epidermis, and from thence, only, to spread to the corium. Evidence in favour of this is afforded by the wrinkling of the epidermis, the disturbance of the pigment, and the quantity of small, superficial teleangiectases. Perhaps the atrophy of the papillary vessels even ushers in this process, since it may, on the one hand, lead to atrophy of the papillæ, diminished formation of epidermis and of pigment, and, on the other hand, to the origin of small teleangiectases.

In connexion with this subject, the circumstance which has been mentioned, that, in the girl 10 years of age, an epithelial carcinoma of so large a size should have developed in the short period of one year, is deserving of very great consideration.* It is well known that epithelioma very often becomes developed from a pigmented wart (*nævus pigmentosus*), and it is therefore reasonable to suppose that the disturbance of nutrition, which in xeroderma affects, in the first place, the papillary layer, the formation of pigment, and of epidermis, was a cause of the epithelioma, which was present in this case, and the elements of which are related histologically to the structures named.†

In reference to the symptom of shrinking, it must be noted that shrinking of the epidermis, alone, which must always be associated with disease of the papillary layer, is competent to cause contraction. If the skin of the face has been affected with chronic eczema for many months, or, indeed, has been covered with diffuse psoriasis, ectropion of the lower eyelids almost

* See also foot-note, p. 254, for a second instance in a girl.

† From a consideration of what has been said in regard to the symptoms of this affection, its development at an early period of life, and its transmutation into carcinoma, we cannot see any objection to look on it as of a *nævoid* character.

always occurs. When the eczema or the psoriasis has been cured, and when the epidermis has again become supple, the ectropion disappears. The fingers are always flexed in chronic eczema, psoriasis, and keratosis of the palm of the hand, and can always be well extended after the cure of the latter. In the same way, the symptoms of shrinking in xeroderma may be easily explained, since the epidermis and the papillary layer appear chiefly affected by the atrophy.

The *prognosis*, according to our experience, is absolutely unfavourable, since neither Hebra nor myself, nor the many physicians who previously and subsequently had the opportunity of seeing the patient first mentioned, witnessed any improvement in the condition of the xeroderma, either as the result of any treatment, or spontaneously.

In all the cases previously mentioned, we have tried a great number of external applications for several months—emollients, mild and energetic caustics, iodine, emplastrum hydrargyri, tar, sulphur, &c.—as well as the internal use of iron, arsenic, and cod-liver-oil, all without the slightest result.

The *second* kind of this disease I consider to be a condition which I have already certainly seen in several cases. The parts affected were chiefly the lower extremities, from the middle of the thigh downwards, less frequently, also, at the same time, the forearms and the hands.

The skin was thin, here and there put on the stretch, and to be pinched up in a fold only with difficulty; in other parts, it could be pinched up easily. Its colour was remarkably pale and white, with here and there a pale pink tint. The epidermic layer was everywhere extremely thin and wrinkled, like gold-beaters' skin, and peeled off in certain parts in thin, asbestos-like lamellæ. The stretching and thinning of the epidermis on the soles of the feet had made the latter very sensitive to pressure from the shoes or on the ground, and it was for the latter reason that the patients affected sought medical advice.

The disease in all the cases had existed from childhood.

From ichthyosis (*nitida*, *nacrée*), of which one thought, in the first place, on seeing this disease, it was distinguished by the striking smoothness, thinness, and the white colour of the epidermis, as well as of the corium itself. Against the supposition of scleroderma, in addition to the character of the symptoms

described, might be adduced, also, the statement that the disease had existed in early childhood, and its stability.

The *treatment* in the cases last described consisted in the employment of salves, having an emollient action on the epidermis, and of plasters, which were applied in order to form a protection against pressure on the soles of the feet.

2. *Senile Atrophy of the Skin.*

In old age the skin appears altered in a particular manner, which we express by the term *Senile Atrophy*.

The skin of an old person has a pale or dark-brown tint, feels dry, less supple, here and there also rough, desquamating. It shows many wrinkles on parts on which they are wanting in young persons. The wrinkles which in the latter are only produced temporarily, by the contraction of certain muscles, which are superficially situated, for example, over the *M. corrugator superciliorum*, the *M. risorius*, &c., have here become permanent. The dark-brown colour and the copious wrinkling, conjointly, chiefly produce the appearances characteristic of old age.

The epidermis is, for the most part, smooth, here and there, however, desquamating in fine scales (*Pityriasis*, *P. tabescens*). Occasionally there are a few, isolated, or very numerous, as many as fifty or more, warty-looking, discoid collections of epidermis scattered more especially over the skin of the back of the shoulders, the neck, and the throat, of the size of a lentil, or a threepenny- or sixpenny-piece, flat, and yellowish-brown or dark-brown in colour. They may easily be lifted off with the finger-nail *in toto*. On their lower surface there may occasionally be seen a whitish, soft, conical process, which had projected into a dilated sebaceous follicle. The mass which forms a little disc is therefore a product of the sebaceous glands. It is very friable, and is found to consist, on examination, of an aggregation of epidermic cells containing fat-globules.

A similar condition has been noted in the crusts of *Seborrhœa congestiva*, *Lupus erythematosus*. Here, however, the fatty infiltration of the epidermic cells is of a more fluid nature, whilst in the skin of old people it is of a firmer, drier character. More frequently, however, we find beneath the epidermic plates mentioned, an excoriated, papillary layer,

which easily bleeds, and is covered with luxuriant warty growths; so that the accumulation in this case may be regarded as truly warty. The skin is also freely moveable, can be lifted up from the subjacent structures and pinched up into folds more easily than in younger and well-nourished individuals, and, at the same time, feels thinned. The subcutaneous fatty layer has, in great part, disappeared, the individuals are emaciated. It is but rarely that we meet with a thickened panniculus adiposus, and this occurs, for the most part, in drinkers.

The condition of the skin in old people, which has been described, represents the combined results of a number of anatomical changes, which affect the greater part of the structures of the skin and the subcutaneous tissue, and which, though not peculiar exclusively to the senile marasmus, yet, nevertheless, are always met with in it. They are, taken collectively, the same changes which are met with also in other organs and structures, physiological or pathological, when they become atrophied, or undergo retrograde metamorphosis, as it is called.

They may naturally be divided into two kinds:—

1. Drying-up, induration (Paget), or simple atrophy (Virchow*). The most striking feature of this form is the dryness of the tissue, the deficiency in juiciness, which is also evidenced by the shrinking of the formed elements. As there is also, obviously, at the same time, a diminished formation or an insufficient reproduction of the structures consumed in the physiological waste of tissue, there also occurs, along with the dryness and shrinking, a very striking atrophy of the part, and emaciation. The epidermic layer is thin, and lies in a straight line on the corium, because its papillæ are either wanting, or else are considerably diminished in situations where they usually appear well developed (Neumann†). The corium is thinned, that is, in certain places (Glatze, Pincus, loc. cit.). Its fibrous tissue is scanty, the meshes are narrow and infiltrated with only a slight quantity of intercellular fluid. The cells which are interspersed (connective-tissue corpuscles) are small. The vessels are here and there filled with pigment; pigment is also met with interspersed between the bundles of fibres, or diffused in the fibres of connective tissue, or connected with

* 'Handb. d. Spec. Path.,' 1 B., p. 305.

† Loc. cit., p. 277.

some of the cells. In addition, the blood-vessels are atrophied (Kölliker) in some places, and in others dilated (Neumann)—conditions which, as regards the pigment and the vessels, are always met with in all structures composed of connective tissue, and, therefore, in new growths, scars, keloid, &c., in which a sluggish interchange of material occurs. The hair follicles are, for the most part, in a state of good preservation, yet, in many places, the papillæ have shrunk or disappeared, the cells of the outer root-sheath have been converted into flat, epidermic scales without nuclei, which fill the follicles, and here and there distend them; the hair is wanting, or is thin and like lanugo-hair. The latter occurs, for evident reasons, principally on the bald scalp. The situation of the sebaceous glands is occasionally only to be recognised as a collection of a yellowish-brown, spherical mass (fat). Here and there, they are dilated, especially in isolated acini, and the latter are filled with lumpy accumulations of epidermic cells (Miliun). The fat-cells are few in number, and these are not well filled, or they are wanting altogether, and only the rhomboidal network of the bands of connective tissue is to be found in the situation of the lobules of fat.

2. The *atrophy* occurs chiefly in the form of a degeneration of the connective-tissue elements of the cutis—degenerative atrophy—(Virchow, loc. cit., p. 306). The constituent elements of the cutis, especially the connective tissue, undergo organic change by a metamorphosis which deprives them more or less of their original character. The latter, for instance, is infiltrated by fine and coarse granules, or, owing to indistinctness and complete disappearance of the contours of the individual fibres, becomes converted into a more homogeneous, tough, or, it may be, brittle mass, for which the designations glassy swelling, amyloid, colloid, hyaloid, wax-like, bacony, or fatty degeneration have been repeatedly used by authors.*

The two kinds of changes named, which bring about the atrophy, do not in any way mutually exclude one another, but are met with side by side; always, however, in certain localities

* Rokitansky, 'pathol. Anat.,' 1859, 1 Th., p. 111 et sequ. Virchow, 'spec. Path. und Therapie,' 1 B., p. 306 et seq. O. Weber, 'Handb. d. allg. und spec. Chirurgie, von Pitha u. Billroth,' Erlangen, 1865, 1 B., p. 349 et sequ.

or in certain structures, the one or the other kind of the atrophy or of the retrograde metamorphosis will preponderate.

The very marked macro- and micro-scopic changes which exist in senile atrophy cannot naturally, however, be considered in any way as its sole cause. The whole process of the retrograde metamorphosis must rather be considered as the result of the diminished energy in the interchange of material, in the formation and the reproduction of the constituents, in the digestion and assimilation of organised material which, throughout the whole organic world, in the complicated organism called man, as well as in the elementary organism of the cell, appears sooner or later as the physiological limit, and is as such designated *Senile Marasmus*.

The senile changes in the skin, therefore, do not differ, in any way, from the precisely similar metamorphoses which other structures, for instance, the bones, the muscles, &c., undergo in old age or from the degenerations which affect the elements of many tissues even in early life (of the individual) (Virchow), if their physiological predisposition or a pathological condition limited to themselves induces premature senility.

B. ATROPHIA CUTIS IDIOPATHICA PARTIALIS.

Striæ et Maculæ Atrophicæ Cutis.

White, scar-like streaks, from one to two inches in breadth and several inches in length, are met with occasionally on the skin in women who have never been pregnant, but who have already passed the age of puberty, and also in men. They take, mostly, a somewhat spiral course, and several are grouped together and traverse the skin at longer or shorter distances apart, almost parallel or at different angles to one another. Now and then, instead of the streaks which have been mentioned, precisely similar, but round or oval, spots occur, scattered over the trunk and the extremities, varying in size from that of a bean to that of a finger-nail or of a half-crown.

By the touch, we detect that the white streaks and spots are somewhat depressed below the level of the surrounding skin, and that where they occur the skin is thinned. If a finger is passed over the affected part, we obtain the impression that the

portions corresponding to the atrophied streaks are situated in a depression or a furrow of the skin.

The atrophic streaks occur most frequently, the spots more rarely. They are quite white, rather glistening and smooth, but here and there a few, isolated, follicular openings (pores) may be recognised. They are most frequently met with in the neighbourhood of the anterior brim of the pelvis, over the gluteal muscles, and in the neighbourhood of the trochanters; less frequently on the anterior surface of the thigh above the patella, on the extensor surface of the upper arm, or on other parts of the body. Over the glutei and the trochanters, they have occasionally a more oblique direction as regards the long axis of the body; at another time, they may entirely or partly take a longitudinal direction. On the extremities, I have always seen them take an oblique course.

Anatomy.—I excised a bit of skin from the left thigh of a young man where it was obliquely crossed by a streak an inch above the knee-cap. I found the epidermic layer and the mucous layer very much atrophied. The latter lay flat on the corium. After the addition of acetic acid, the Malpighian layer separated in its entirety from the corium, the surface of which showed a uniform contour without any conical projections. The separated mucous layer showed a similar flat surface, unprovided with depressions for the papillæ, towards the corium. The papillæ, therefore, had entirely vanished. Here and there, however (with the aid of Hartnack's No. 9 object-glass and ocular 3) a series of extremely thin and short projections from the corium could still be discovered which penetrated into the Malpighian layer, but, even with a magnifying power of 600 diameters, no vessel could be recognised in their interior. The network of connective tissue and elastic fibres consisted of very thin bundles, between which only extremely few and slender blood-vessels existed. The fat-lobules of the subcutaneous cellular tissue could only be recognised by the wide, rhombic meshes of their framework. There were no fat-cells within them. In the bit which was excised, I only found in isolated spots roundish nests of molecular, yellowish brown masses to indicate the contents of an acinus of a sebaceous gland. I also saw only two extremely attenuated hair follicles. In the middle of each follicle, I found a fine hair whose root-sheath was made

up entirely of flat epidermic lamellæ. There was no trace of the cells of the outer root-sheath to be seen. There was no indication of any sweat-glands.

Etiology.—In reference to the cause of the idiopathic atrophic streaks and spots on the skin we have scarcely anything to advance beyond mere conjectures.

It is tempting, on account of the external similarity, to refer these streaks to a cause analogous to that of the atrophic streaks and spots on the skin which arise after pregnancy. B. S. Schultze,* who examined several hundred persons in reference to the occurrence of atrophic streaks, found that, of females who had never been pregnant, or who were not far advanced in pregnancy, 36 per cent., and of men, 6 per cent. showed such streaks on the thighs and the buttocks; of tall men, 25 per cent. He is therefore of opinion that the rapid growth of the pelvis causes this partial atrophy, by stretching the skin, and moreover that in women, in whom the pelvis increases chiefly in breadth, streaks arise which have a direction chiefly parallel to the long axis of the body, and that in men, in whom the pelvis increases rather in its length, streaks arise which take an oblique course.

Such a view, however, still leaves unexplained the development of the circular atrophic spots, of the size of a lentil or of a half-crown, which occur, for the most part, on the trunk itself. Besides, we must bear in mind that such a mechanical cause will also produce an internal tearing and lesion of the skin, antecedent to the atrophy, which will be accompanied by a rupture of the blood-vessels, and, therefore, will have previously become manifest owing to hæmorrhage, which, as in the stretching of the skin by tumours, pregnancy, &c., must become evident in the form of blood-stained streaks corresponding to the course of the artificial atrophy. Such a symptom has never been observed by anyone, however, to precede the atrophy.

In certain special cases, a disturbed nerve influence has been stated to be the cause of the atrophy. Wilson mentions† that white, linear, atrophic, and anæsthetic streaks have become developed, corresponding to the distribution of the nervus fron-

* 'Jena'sche Zeitschrift für Med. und Naturw.,' 1868, iv. B., 3 u. 4.

† 'On Diseases of the Skin,' 5th edit., p. 404, and the 'Journal of Cutaneous Medicine,' July 1867, p. 143.

talís, naso-alaris, and supra-orbitalis. Wilson admits therefore, in addition to the *Striæ Atrophicæ Cutis* (or "linear atrophy") *traumaticæ* and *idiopathicæ*, also a third kind, *neuroticæ*.

The first case was that of a lad, 17 years of age, who had received a blow on the forehead. He noticed a white line in the skin corresponding to the course of the supra-orbital nerve. Some years later, the skin corresponding to this line was anæsthetic and atrophic. The second case was that of a youth, aged 17, in whom a precisely similar symptom developed gradually after violent sneezing.

It would be quite allowable to suppose that, in the cases last mentioned, the skin had been torn, in the direction stated, in its deepest layers, from traumatic causes; by the blow, and by the stretching in consequence of the act of sneezing; and, that it was in this way that the linear depression had remained permanent.

2. *Atrophia Cutis Symptomatica.*

This form of atrophy appears as the result of a demonstrable traumatic or pathological process. This may also be divided, naturally, as in the form just described, into, 1, Simple Atrophy, and, 2, Degenerative Atrophy. It must, however, be insisted on that this distinction only applies to consecutive atrophy, taken as a whole, and not to all its details.

Under the first head will come the forms of partial atrophy of the skin which are produced by pressure.

The most familiar are the scar-like spots and streaks which arise after excessive straining, stretching, and partial rupture of the deeper layers of the corium, which occur owing to distension. Thus, they are found on the skin of the abdomen, on the buttocks, and in the neighbourhood of the trochanters, owing to an enlarged, pregnant uterus, ovarian cysts, ascites, and neoplastic tumours in the abdominal cavity; on other parts over tumours of various kinds.

In consequence of the excessive distension of the skin of the abdomen, owing to the pregnant uterus, ruptures occur in the subcutaneous tissue and the deeper layers of the cutis. These are recognised, externally, by blood-red, hæmorrhagic stripes and streaks, which are due to the rupture of the blood-vessels occurring at the same time, and which, for the most

part, traverse the skin of the abdomen in irregularly spiral lines. They are accompanied by pain, often by very tiresome itching, and make their appearance in the greatest numbers in the course of from the sixth to the eighth month of pregnancy, increasing, however, up to the end of pregnancy by the addition of fresh ruptures. The hæmorrhagic effusion gradually becomes absorbed, and the abdominal wall, after delivery, shows, in addition to a remarkable wrinkling, deep, at first still brownish, and later, quite white, spots and furrows, which correspond to the lines already mentioned, have a strong resemblance to scars, and, therefore, are called cicatrices of pregnancy, and which persist during the remainder of life. The atrophy in these cases affects, chiefly, the deeper layers of the corium and the fatty layer, because the looser bundles of fibres contained in them are drawn asunder by the pressure exercised from within.

The cicatricial atrophy and attenuation of the skin which are met with in the form of spots and stripes, in connexion with other kinds of tumours, on the abdomen or on other parts of the body, have a precisely similar origin.

Circumscribed, white, cicatricial atrophy of the skin arises, moreover, under all circumstances in which dense, pathological, cellular infiltrations occur in the interstitial spaces of the corium, as, for instance, in syphilitic tubercles and nodes, the tubercles of lupus and of elephantiasis græcorum, and this results all the more certainly the longer the cell-infiltration has remained there. A syphilitic papule, however diminutive it may be, leaves behind it, after the complete absorption of the cell-mass of which it was formed, a depression in the skin proportionate to its size, which, at first, is white in the centre and surrounded by a brownish, pigmented areola, and which, later, appears uniformly white. It would appear, either, that, owing to the pressure which the densely packed cells exercise on the connective-tissue fibres of the skin and its papillæ, the old elements become atrophied, whilst, from the same cause, the formation of new elements is interfered with; or that the process of metamorphosis which the cells of the pathological infiltration (tubercles) undergo, and by which they become adapted for absorption, also involves, at the same time, by contagion, the physiological constituents of the tissue, and causes them to be absorbed. According to this view, the thin, white, glistening

patches of skin with but few follicles, which remain after the spontaneous healing of the processes mentioned, lupus, for example, are not to be regarded as scars, but as atrophy of the skin. In a similar way, partly owing to pressure from the exudation and the cell-infiltration, partly owing to the participation of the elements of the corium in the retrograde metamorphosis and absorption, and partly owing to the shrinking of the blood-vessels, partial atrophy of the cutis occurs in the course of chronic inflammatory processes and the exanthemata.

The atrophy which arises from pressure on the skin, from without, represents a third modification; under favus crusts, the cones of corns (Rokitansky,* Simon,† v. Bärensprung,‡ Virchow§), callosities, &c. In the latter, besides the atrophy of the papillæ of the corium, a hypertrophy may also occur. In favus, after removal of the scab, there is left a shallow, saucer-shaped depression, which, however, only involves the mucous layer and is again filled up within a few hours. There is no doubt that sometimes an absolute thinning of the corium occurs, for the most part, however, on those parts which remain as white, cicatricial spots of skin, sparsely covered with hair, after a spontaneous cure of the favus, and on which, also, the greater number of the follicles appear atrophied or shrivelled up.

The second kind of symptomatic atrophy, the so-called degenerative, occurs chiefly in association with any of those processes in which inflammatory, neoplastic and syphilitic exudations and infiltrations have been deposited in the corium, and the subcutaneous tissue, in a chronic form. In chronic eczema, for instance, in frequently recurrent dermatitis, in chronic ulcers of the leg, principally around chronic ulcers, in the neighbourhood of syphilitic sclerosis, in pachydermia which arises in consequence of similar cutaneous inflammations, recurrent erysipelas, lupus, ulcerated syphilitic gummata, elephantiasis græcorum, &c.

In all these processes, the normal elements of the tissue of the skin, owing to pressure from the infiltrating masses, obliteration of the vessels, or to extension of the organic process of

* 'Path. Anatomie,' 2 B., p. 82.

† 'Hautkrankheiten,' p. 33.

‡ 'Beiträge zur Anat,' &c., p. 10.

§ 'Verhandl. der Würzburger physic. med. Ges.,' Bd. v., 1854, p. 97.

involution, to which, as a rule, those infiltrations themselves succumb, undergo to a greater or lesser extent organic metamorphoses, which are similar to that of the atrophy of the tissues generally, and which have been described in accounts of the disease in question, as fatty, bacony, wax-like, amyloid and hyaloid degeneration, and as glassy swelling by Rokitansky, v. Bärensprung, Buhl, O. Weber, Virchow, Lindwurm,* Neumann, and others.

The degenerations mentioned can be most strikingly demonstrated in the fibres of connective tissue, and in the walls of the vessels. The way in which they are combined, and the degree in which they are developed, vary widely in different cases and in different localities. There is very little to be said in reference to the source or the locality from which such degenerations arise. The view that the disease of the walls of the vessels affords the starting-point for these metamorphoses (O. Weber, loc. cit.) finds support, in many cases, from the circumstance that the disease of the vessels is recognisable before the degenerative atrophy of the other tissues can be discovered. In any case, however, under these circumstances, the form of atrophy of the skin under discussion must be considered as a complication or a consequence of some other primary pathological process (lupus, dermatitis, &c.), and not as an independent form of disease clinically.

* 'Hypertrophie und Ulceration mit amyloider Degeneration der Haut,' in *Zeitschr. f. rat. Mediz.*, 3 Reihe, xiv. Bd. (Taf. iii.), p. 269.

CHAPTER XLVI.

GENERAL REMARKS ON NEW GROWTHS.

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IN the system of classification of diseases of the skin adopted in this work (see vol. i., p. 48), the "new growths" are divided into two classes. In Class viii. we shall treat of the "benign," and in Class ix. of the "malignant" growths. The expediency of such a subdivision, or, indeed, the possibility of retaining the two classes last named, in the manner originally intended, is quite open to discussion.

Since the doctrine of Cellular Pathology obtained for histological investigation an importance, a breadth and depth never before imagined, and functions have been traced to cell-life which were formerly attributed to complete systems of tissues, doubts have arisen as to the value of the above classification. Since Virchow succeeded in demonstrating that the biological properties of the connective-tissue corpuscles exercised an influence on pathological nutritive processes, which was previously unrecognised, the discovery, by Recklinghausen, of the migration of pus-corpuscles, and, by Stricker, of the permeability of the walls of the vessels to the formed elements, and the further discovery, by Cohnheim, of the migration of the colourless blood-corpuscles, have made us acquainted with new factors in the pathological activity of the tissues which far exceeded the scope of such a classification.* Another was soon added to the number of the self-productive elements, for, besides the connective-tissue corpuscles and the colourless blood-

* Addison and Aug. Waller, in England, had, to some extent, forestalled these observers. (Burdon-Sanderson 'On Inflammation,' Holmes' 'System of Surgery,' vol. v., p. 741.)—Tr.

corpuscles, the epithelial structures were also demonstrated to be reproductive.

The appearances of independent production observed in the formed elements named, interesting as they might be under the microscope, and though they opened up an entirely new field of organic life, consisted, in the way in which they were represented, of phenomena distinct from the processes belonging to the organism in general, and without any bond of connexion with it.

The clinical physician, whose object is to trace the physiological manifestations of the organic vitality of the individual, and their variations—diseases—now became aware, in addition to the vitality of the organism as a whole, of an individual vitality of particular elements to a certain extent distinct from this, and consequently found his ideas in a state of uncomfortable indecision. It is only since Stricker has shown how the fundamental characteristics of the cellular pathology may be reconciled with the older views of the relations of the vessels and nerves to the processes of growth, that the connecting link between the functions of the whole organism and the phenomena of the nutrition of the individual elements has become re-established, and clinical observation has become once more supported on its true basis, only made more secure by these discoveries, of the unity of all nutritive processes.

Having thus obtained a firm foundation again, clinical medicine may make full use of the acquisitions which the histology of later years has afforded. The recognition of the fact, that the distinctions hitherto drawn, pathologically, between inflammation, hypertrophy, and new growth, whilst they agreed with well-marked, naked-eye appearances, merely arose from the requirements of practice, must not be reckoned amongst the least of these. For practical purposes greater stress was laid on certain symptoms of disease, and, by force of habit, these came to be regarded as real distinctions between the individual processes named. Modern investigation has thrown fresh light on these processes, formerly so obscure, and, as a result, the artificial lines of demarcation have been wholly effaced. According to modern histology, new growth occurs simultaneously with inflammation. The first epithelial cell which, in catarrh of a mucous membrane, develops a second out

of itself, has begun neoplasia. This fact is not simply acknowledged, but is extensively made use of in the teaching of clinical medicine, and if, nevertheless, the old established division of pathological processes into inflammation, hypertrophy, and neoplasia is made use of, this is more allowable than formerly, because the task to be performed and object in view are better understood. So far as external morbid phenomena, which are mutually related, are grouped together, and the recognition of their outward characters is rendered feasible, clinical medicine is a practical art; so far as the internal characters of those phenomena can be demonstrated with the aid of physiology and histology, it is a natural science.

It is only, therefore, for practical purposes, and solely for convenience of description, if, according to the notions of former times, we designate as new growths certain organic productions which, in regard to "external configuration, internal structure, and vegetation" (Rokitansky), situation, relation to surrounding tissues, and the pattern of the affected organ and structure, appear extraneous and intercalated.

Moreover, it is also purely for practical purposes that we are induced to pay particular attention to the fact, shown by experience, that certain of these "pseudo"-formations, which are foreign to the normal organism, may exist for years without exercising any particularly deleterious influence at the locality in which they are situated, and also without affecting the organism, as a whole, in any perceptibly hurtful way, consequently showing, from a practical point of view, a "*benign*" character—"benign" new growths; whilst, on the contrary, others of these structures not only spread locally, destroying the normal tissue, but, especially, by exercising a manifestly deleterious influence on the whole organism, show what is commonly called a "*malignant*" character—and constitute *malignant* new growths.

By thus combining external phenomena having a mutual connexion into groups, and bringing them before the student, we not only facilitate his conception of the clinical symptoms—Symptomatology—but also his comprehension of the inner relations of those morbid products—Histology—Nosology.

We will therefore describe the new growths according to the following arrangement:—

CLASS VIII.—BENIGN GROWTHS.

I.—Growths made up of connective tissue.

Keloid.

Scars.

Molluscum fibrosum.

Xanthoma.

II.—Growths made up of vessels.

Angioma. Growths consisting of blood-vessels.

Lymphangioma. Tumour composed of lymphatics.

III.—Growths made up of cells.

Rhino-scleroma.

Lupus Erythematodes.

Lupus Vulgaris.

CLASS IX.—MALIGNANT GROWTHS.

Lepra.

Carcinoma.

Sarcoma melanodes.

CHAPTER XLVII.

(CLASS VIII.—BENIGN GROWTHS.)

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DIV. I.—CONNECTIVE-TISSUE GROWTHS.

KELOID.*

KELIS, Kelos, Cheloide, Cancroide, Tubercles durs, Cancelli, Cancroma, Cancro blanc, le Crabe, der Knollenkrebs (Fuchs), Dartre de graisse (Retz).

History.

Though Retz had already, in the year 1790, described under the name "Dartre de graisse"†), a cicatricial tumour of the skin, which he thought was of spontaneous origin, yet Alibert was undoubtedly the first to establish the peculiar nature and the clinical characters of the morbid affection in question.

* Already published in the 'med. Wochenschrift,' Nos. 24, 25, 26, 1871.

† 'Des Maladies de la Peau et de celles de l'esprit,' Paris, 1790, p. 55. Retz writes: "Cette maladie est fort extraordinaire, je ne l'ai observé jusqu'à présent qu'à trois fois. L'épiderme n'est point altéré; cette membrane a seulement pris une couleur rouge foncée; elle est soulevée par des amas d'une matière solide, qui forme tantôt des espèces de noyaux qui parviennent jusqu'à la grosseur d'un abricot, tantôt des rayons longs d'un doigt et gros comme cette pâte italienne qu'on nomme, macaroni, ou bien cette même matière comprend de grands espaces sous la peau et y paraît sous la forme de loupes plates et étendues, fort élevées et de la grandeur d'une ou deux mains. Ces plaques de loupes sont singulièrement entrelacées par des filons de la même matière, de différentes grosseurs, qui ressemblent à des grosses cicatrices, et forment plusieurs plis et replis, comme s'il y avait plusieurs cicatrices les unes sur les autres ou les unes auprès des autres. Je sens toute la difficulté qu'il y a de saisir le caractère de cette maladie sans l'avoir vue, par l'impossibilité où j'étais de me la représenter avant de la voir" (Rayer, loc. cit., p. 672).

In the first folio edition of his work, 'Description des Maladies de la Peau,' Paris, 1814, p. 113, Alibert has described the disease under the name of "Cancroid." He did not, however, give it this name on account of its somewhat fanciful resemblance to cancer (hence, however, nodular cancer, Fuchs), but rather on account of its similarity to the appearance of a crab lying on the ground with its claws stretched out ("poussant quelquefois vers leurs bords de petits prolongements bifurqués, qui ont quelque rapport avec les pattes d'une écrevisse; ce qui justifie manifestement la denomination que nous avons donné à ces tumeurs extraordinaires," loc. cit., 113). As early as the year 1817, Alibert had changed the name Cancroid, however, for that of Cheloid, in a publication of the *Mem. de la Société Med. d'Emulation*, p. 744, entitled 'Quelques recherches sur la Cheloïde,' as pointed out by Fagge.* The latter designation was also retained in Alibert's smaller work, which appeared in the year 1829, 'Précis théorique et pratique des maladies de la peau,' as well as in the edition of this work which appeared in the year 1835, re-edited by Dr. M. Daynac, under the title 'Monographie des dermatoses, ou Précis theorique,' &c.

The statement of Dieberg ('deutsche Klinik,' 1852, No. 33, p. 369) that Rayer was the first to make use of this designation, is opposed not only to the evidence of Rayer himself,† who, in common with the later authors, Gibert,‡ Schedel and Cazenave,§ &c., expressly ascribe the authorship, both of the symptomatology and of the designation, to Alibert entirely, but, also, especially to Alibert's own statement, for he says, in the chapter above quoted, in the year 1817: "I described this affection, first of all, in the annual lectures which I gave at the Hôpital St. Louis, under the name Cancroïde. Since then, however, it has appeared to me that the term cancroïde had too great a similarity with cancer, a name which is commonly used to designate a disease wholly different to the one under considera-

* 'On Keloid, Scleriasis, Morphœa,' Guy's Hosp. Rep., 1868.

† 'Traité théorique et pratique des maladies de la peau.' Paris, 1835, p. 672.

‡ 'Traité pratique des maladies spéciales de la peau.' Paris, 1840, p. 414. Gibert says, here, that Alibert adopted the name Keloid on account of the resemblance to the claws of a crab.

§ Abrégé pratique, &c. Paris, 1847, p. 602.

tion, and this may easily lead to mistakes being made. I have, therefore, determined to describe this form of tumour under the name of Cheloide* on account of the peculiar processes which radiate from its extremities, and which appear very similar to the claws of a crab. If we imagine a crab or other crustaceous animal implanted in the skin with its claws outstretched; we shall obtain an idea of the appearance of this growth, which is as strange as it is uncommon."

Although Alibert was undoubtedly the first to establish any conception of the true nature of keloid, to him is also due the uncertainty which subsequently prevailed in regard to its definition, for, in his 'Monographie des Dermatoses,' &c., published in the year 1835 (translated into German by Dr. M. Bloest, Leipzig, 1837, 2 Bd., p. 141), he distinguished a Kelis genuina (the nodular cancer), and a Kelis spuria, of which the first was more especially to be distinguished from the second by its painfulness.

Though Fuchs† only admitted one kind of keloid, that of the true keloid, of spontaneous origin, yet subsequent authors, who expressed their opinions on the subject—Warren, sen.,‡ Dieberg,§ De Chapelle,|| Hawkins,¶ Longmore,** Wilson††—were in favour of admitting, in addition to the genuine (true) keloid, a false or cicatricial keloid (Dieberg), a warty, cicatricial tumour (Hawkins' keloid, Dieberg), and even a syphilitic keloid (Wilks‡‡), Westphal,§§ Bennett.||||

When we bear in mind that Addison¶¶ has also described, under the name of "Keloid," a disease which we have already

* From χηλῆς, claw, talon.

† 'Die Hautkrankheiten,' &c., p. 571.

‡ Geschwülste, Uebers v. Bressler, 1853, p. 209 ('Surgical Obs. on Tumours,' p. 41).

§ 'Deutsche Klinik,' 1852, No. 33, p. 209. (Dieberg had not, himself, seen any keloid.)

|| 'Journal de Bordeaux,' 1863, 2 ser., viii., p. 160 (Schmidt's 'Jahrb.,' Bd. 122, p. 189).

¶ Froriep's 'Notizen,' 1842, s. 183.

** 'Med. Chir. Trans.,' xlv., p. 105.

†† 'On Skin Diseases,' &c., 1867.

‡‡ Sam. Wilks, 'Guy's Hosp. Rep.,' vii., 1861, p. 297.

§§ 'Deutsche Klinik,' 1860, No. 21, p. 209.

||| 'Principles and Practice of Medicine,' p. 950.

¶¶ 'A Collection of the Published Writings of the late Thomas Addison,

shown to be synonymous with *Scleroderma adutorum* (see p. 109 of this present volume), we must admit that there was sufficient cause for confusion as to what was meant by the term Keloid, although it is true that Addison's essay was but little known till it was published by the New Sydenham Society:

The unreasonable manner in which the meaning of the term Keloid had thus been extended by the authors named induced other observers to return to the original, strict definition of keloid. Thus Schuh,* Wedl,† Pick,‡ and Fagge,§ in their respective treatises, only include under the term Keloid those tumours of the skin resembling scars, which have arisen spontaneously, without any preceding wound, or inflammation, or ulceration of the corium.

In the account which follows, it will be shown how far the separation of a true from a false keloid, or a limitation or combination of ideas, may be the more appropriate.

Symptoms.

Keloid occurs as an evenly raised, sharply defined, doughy, elastic tumour, looking as if implanted in the skin, projecting above the level of the neighbouring parts to the extent of half a line, or of several lines, greatly resembling a hypertrophied scar, and varying much in form and size. Sometimes it looks like a piece of beading, is styliform, rod-like, oval, cylindrical, diminishing laterally at the middle,|| biscuit-shaped, or forms a thin or thick disc or plate, the lower half of which is imbedded in the skin, and the upper half elevated above it. It is frequently met with in the form of a star-shaped or radiating lattice- or net-work in the skin, the centre of which is elevated, and the processes slope gradually down to the level of the surrounding parts. It very rarely takes the form of a rounded, tuberculous nodule in the skin.

In colour, keloid is white and shining, but occasionally it is of a uniform, or patchy, pinkish tint. Its surface is uninterrupted in its continuity, smooth.

edited by Dr. Wilks and Dr. Daldy. New Sydenham Society, vol. xxxvi., London, 1869.

* 'Pseudoplasmen.' Wien, 1854, s. 90. Schuh speaks erroneously of "Rayer's" Cheloid. † 'Histologie,' p. 461.

‡ 'Wiener med. Wochenschrift,' 1867, p. 899 et sequ. § Loc. cit.

|| Alibert, Atlas, pl. 28, 29, Cancroïde ovalaire, cylindracée.

The epidermis is thin, sometimes somewhat wrinkled, mostly, however, tense, and is continued without any noticeable line of demarcation over the border of the new growth into the epidermis of the adjacent healthy skin. Occasionally, a few thin hairs are met with on the patches. The central portion of the level surface of the larger, discoid patches of keloid is frequently somewhat depressed, whilst the border appears thickened in the form of a rim, and slopes rather steeply.

Both the larger, discoid, and the elongated, cylindrical forms of keloid often send out processes from two opposite points, which diverge on either side, and, tapering gradually, are lost in the surrounding healthy skin. Owing to these processes, the growth appears not unlike a crab (crustaceous animal) placed on the skin, the central plate or spindle representing the body, and the processes the feet or claws of the crustaceous animal. It is from this resemblance that Alibert, as noted above, according to his own statement, was led to adopt the name *Cheloid*.

Keloid is of a firm, elastic consistence, and, as a rule, is moderately painful on pressure. Often it occurs singly, but it is sufficiently common, indeed is what usually happens, for two, or more, or even as many as twenty patches to be met with on the same individual, as I saw two years ago, in an officer. The patches in such cases, as a rule, are situated not far from one another, on the same part of the body, but this is not by any means invariably the case; occasionally, they are remarkably symmetrical, or arranged in groups, and vary very much from one another in size and shape.

The situation in which they are most frequently met with is the skin of the trunk, on the sternum, *mammæ*, on the side of the chest, on the back, and on the back and front of the neck. In most cases, keloid occurs on the sternum, and if there are several patches present at the same time, they are chiefly situated in the direction of the ribs, and therefore arranged in so many rows, and parallel to one another. Keloid of the breast, according to my experience, mostly forms an angle with the transverse line of the trunk. Less frequently, it is met with on the face, on the concha, and the lobule of the ear; in the latter case often occurring on both sides at the same time, on the flexor or extensor surfaces of the extremities, on the back of the hand or of the foot, and on the external genitals.

The tumours are mostly painful on pressure, as has been mentioned. A few patients, however, complain of spontaneous pricking or burning pains, which, occasionally, may be so severe, and may recur so constantly, as to be very troublesome. It is by this spontaneous painfulness, according to Alibert and many other authors, that the true keloid is distinguished from the false variety (cicatricial keloid). As already pointed out, however, painfulness cannot in any way be reckoned as one of the constant subjective symptoms of keloid.

In comparison with other skin diseases, keloid is but rarely met with, but not by any means so infrequently as authors are inclined to think from the scanty literature of the subject. On the other hand, the latest calculation of Wilson, that it occurs in the proportion of one to every two hundred cases of skin diseases, seems too high, and is probably due to a slip of the pen. ('On Skin Diseases,' v. Ed., p. 349.) We find the proportion in the practice of Hebra and myself here, to be one case of keloid to every two thousand cases of skin disease.

Keloid does not exercise any influence on the patient's general health.

Mode of Development, and Course.

It is but seldom that an opportunity occurs to watch a patch of keloid in its earliest stage, and in the course of its further growth. The latter, under any circumstances, proceeds but slowly. In patients who have come under treatment repeatedly, during a series of years, on account of some other frequently recurring malady, psoriasis, for example, and who were also affected with keloid, we have seen new patches of keloid develop in addition to the older and larger ones. They consist, at the commencement, of brownish-red streaks of skin, with a pale red or whitish lustre, of the size of oats or barleycorns, flat, or already slightly elevated, communicating a sense of resistance, and, mostly, slightly painful on pressure. In the course of many months, or of years, the linear or streaky keloid increases in one or the other direction, or in every superficial dimension, and thus assumes one of the characteristic shapes mentioned above, with or without processes. At the same time, it has become somewhat thicker, and is more elevated. Occa-

sionally, it increases equally in thickness, and it then becomes a tuberos, firm tumour.

Having attained a certain bulk, its further growth appears to be arrested. Its shape and consistence then remain the same, and, at the most, it only varies slightly in its colour from fluctuations in the injection of the vessels. Even when it has existed for years, keloid neither suffers superficial alteration, never, therefore, forms ulcers, nor does its internal structure undergo any of the alterations which are known as the so-called retrograde metamorphosis. Keloid, therefore, remains, as a rule, unaltered for the remainder of the patient's life when it has once attained a certain degree of development.

The spontaneous involution of a patch of keloid, or of many patches existing on the same individual at the same time, has only been observed in a few cases. Such, for instance, as mentioned by Alibert and, under particularly noteworthy conditions, by Hebra. The latter watched several patches of keloid through the various stages of involution to their complete disappearance, in the case of a girl, and also saw several patches of keloid on one of her sisters. In both, the keloid occurred on the back, and resulted from acne. Hebra, who convinced himself, in the course of an observation extending over several months, of the involution of the tumours, learnt at the same time that a third sister and their mother had also suffered from similar tumours, but that, in the case of the two latter, these had already entirely disappeared.

Etiology.

Speaking generally, no more is known in regard to the etiological influences which produce keloid than in regard to those of other growths and is expressed in the common idea of local or constitutional predisposition, which, in fact, explains nothing. Such a supposition is the only resource in any case in which so remarkable and persistent a new growth as keloid becomes developed on an uninjured or, at least, not demonstrably injured portion of skin.

Age and sex do not appear to exercise any influence in the production of keloid. It occurs, mostly, in individuals in the middle period of life, commencing at puberty; it is very rare

in young persons, and occurs just as frequently in the male sex as in females.

In many cases, however, it is certain that, on the one hand, local, very insignificant injuries and irritation have directly caused the development of keloid, and that, on the other hand, keloid has been developed around and beneath previously existing scars. Thus, keloid may frequently be noticed around the small scars of leech-bites. I have several times seen a keloid-like fibrous hardness become developed around the hole in the lobule of the ear which had been bored for the earring, so that the puncture appeared to consist of a fibrous sheath. By continuous growth, this frequently forms a nodule the size of a nut, causing a great increase in the size of the lobule.

Certain individuals and races appear to possess a special predisposition to the development of this form of keloid. In some persons, keloid becomes developed at each puncture left by a leech-bite, and wherever a blister has been applied. I would call attention, also, to the statement of many physicians (Dr. Langlaard) and laymen, which I have previously quoted in another place, to the effect that in negroes of certain races, at every part of the skin to which irritation has been applied, or where they have been pricked, or, in short, wounded in any way, and especially where scars have remained from the strokes of a cane or the lash of a whip, firm cutaneous tumours of a corresponding shape become developed. One of these negroes may consequently, as age advances, possess a great number of these tumours, of the shape, size, and appearance commonly met with in keloid, or even as large as fists. I have minutely examined one such tumour, removed from the skin of a negro, and have described it in the 'Med. Wochenschrift,' No. 1, 1869. Dr. F. F. Maury, of Philadelphia, has written on the same subject (in the 'Photographic Review,' 1870, October). That these large tumours have left the original seat of the keloid in the corium, and may extend into the subcutaneous tissue, does not at all alter the state of the case.

Diagnosis.

The clinical diagnosis of keloid has hitherto chiefly rested on its etiology. If a tumour of a cicatricial appearance becomes

developed on a part of the skin not previously wounded, that is, spontaneously, we have to deal, in the first place, with spontaneous keloid, according to Alibert and his followers, or, according to Fuchs and his followers, with keloid, simply, because the latter does not admit any other form to be keloid. If, in the second place, a firm tumour resembling a scar, and elevated above the general surface, is developed on a previously damaged part of the skin, then we have to deal with a cicatricial keloid, or false keloid, according to the former, and, according to the latter, not with keloid at all, but only with a hypertrophied scar. To choose rightly between these different views appears no less difficult than, as a rule, to make certain of the basis of these distinctions—the etiological influence itself. If we determine to accept as keloid only such growths as arise spontaneously, that is, on a part of the skin previously uninjured, it is always a critical matter to found the diagnosis merely on the cause, whether spontaneous or following on a wound, because these circumstances can only be ascertained from the previous history of the patient. The statements of the patient, as is well known, are of very doubtful value, apart from the fact that slight injuries are either overlooked or forgotten by most persons.

Clinical experience has established the fact that keloid-like tumours may become developed on parts of the skin which have been merely irritated, or after very inconsiderable or hardly perceptible injuries. When, after the application of a blister, the epidermis has been removed, the papillary layer remains wholly uninjured, and reproduction occurs without any loss of substance, without any scar. Nevertheless, we see keloid develop subsequently in such cases. Should such a tumour be regarded as keloid or not, as true or false? When a leech has been applied there remains behind a triangular, slit-like scar. Around and beneath this, not, as authors say, upon it, there is occasionally developed, in course of time, an elevated, cicatricial nodule, as large, even, as a half-crown, and which, therefore, involves the adjacent skin, which was previously uninjured, for some distance beyond the original situation of the scar. Similarly, smaller or larger keloid-like lines and tumours become developed around the perforations for earrings; in many negroes, and in a few individuals of other races, around the scars of punctures, scratches, or cuts, or on portions of skin which have

been contused or striped with a lash ; and all these have, therefore, passed far beyond the limits of the original scar into the adjacent healthy skin. Ought all these to be regarded as keloid, or only as false keloid, or no ? or where is the line to be drawn between keloid which arises on completely uninjured skin, and that which has become developed around the hardly perceptible scar of a scratch, or on a portion of skin which has only been deprived of its epidermis ? Clinical experience teaches, thirdly, that scars may be developed in places where loss of substance of the skin has occurred from operation, cauterisation, burns, syphilitic ulceration, lupus, &c., which remain within the limits of the loss of substance of the skin, which do not encroach on the adjacent healthy skin, which do not, however, remain at the same level, but are more or less-elevated, feel firm to the touch, and appear of a reddish colour—in short, represent so-called hypertrophied scars, looking, however, exactly like keloid. Does this kind of scar belong also to the false, or cicatricial keloid ? Or where is the line of demarcation between these and those mentioned secondly, which become developed in connexion with very slight injuries ? Where does keloid cease—where does the hypertrophied scar commence ? Or is it probable that the so-called spontaneous keloid is only a hypertrophied scar ? Would it be better for the name Keloid to be allowed to fall into disuse (Billroth) ? and is von Bärensprung justified when he denies keloid any right of existence at all ?* That is, lastly, are not all three kinds of keloid identical with one another, and to be grouped under one of the heads mentioned ?

The results of microscopical examination would appear to be of more value in the diagnosis of keloid and keloid-like scars than of any other pathological formation, and we will, therefore, consider them in some detail.

Anatomy.

There is no lack of anatomical examinations of keloid, as is evident from the accurate compilation of Langhans (Virchow's Archiv, Band 40, p. 334). The greater part of these, however, relate to keloid without any regard to its origin, or they concern undoubtedly cicatricial keloid, without any attention being paid to the origin of the scar itself.

* 'Hautkrankheiten,' 1 Lieferung, 1859, p. 102.

Accounts of such examinations have been already recorded by Alibert,* Warren, sen.,† Benz,‡ Hawkins and Toynbee,§ Follin,|| Schuh,¶ Rokitansky,** Wedl,†† Lebert,‡‡ Virchow,§§ Benjamin,||| Langhans,¶¶ Warren, jun.,*** Neumann.†††

Langhans and Warren, jun., have entered into most detail, the first having examined the minute structure of a spontaneous keloid, and the latter a similar one, which I removed from a patient of Hebra's Clinique, and also a so-called cicatricial keloid.

According to these, and to my own researches, the anatomical conditions are as follow :

1. As regards the idiopathic (spontaneous, true) keloid.

In longitudinal sections made at right angles to the surface, may be seen, even with the naked eye, a whitish, densely fibrous mass of tissue, situated in the tissue of the corium, and having its fibrous tissue arranged in a direction parallel to the surface and the long axis of the tumour. Under the microscope, the epidermic and mucous layers, as well as the papillæ, appear normal. The extraneous mass of tissue, the keloid, is situated in the tissue of the corium itself, in such a way that a distinct layer of normal corium-tissue can be made out superficial to and beneath the growth. The mass of keloid is, as a rule, thickest in the centre, and tapers off at each end (spindle-shaped). It consists of fibres, which are densely packed together, and run, for the most part, parallel to the long axis of the tumour, and to the surface of the skin. In some places, bundles of closely packed fibres may be discovered, which ascend obliquely across the horizontal mass of fibres (Langhans). In the mass forming the body of the keloid, nuclei and nucleated spindle-shaped cells are only met with in small quantity. The latter, however, may

* Clinique de l'hôpital St. Louis, 1833, p. 209.

† 'Geschwülste.' Uebersetzt von Bressler, 1839.

‡ Oppenheim's Zeitschr. f. d. ges. Medizin, xviii., 1841, p. 343.

§ Froriep's 'Notizen,' 1842, p. 183.

|| 'Gazette des hôpitaux,' 1849.

¶ 'Pseudoplasmen,' 1854, p. 91.

** 'Path. Anatomie,' 1856, p. 70, ii. B.

†† Loc. cit.

‡‡ 'Maladies cancr.,' 1851, p. 682.

§§ Geschw., ii., p. 242, und deutsche Klinik, 1860, p. 209.

||| Virchow's Archiv, Band viii., p. 535.

¶¶ Virchow's Archiv, 40 B., p. 332.

*** Sitzungsbericht der k. Akademie der Wissensch., 1868, Märzheft.

††† 'Lehrbuch der Hautkrankheiten,' 1870, p. 336.

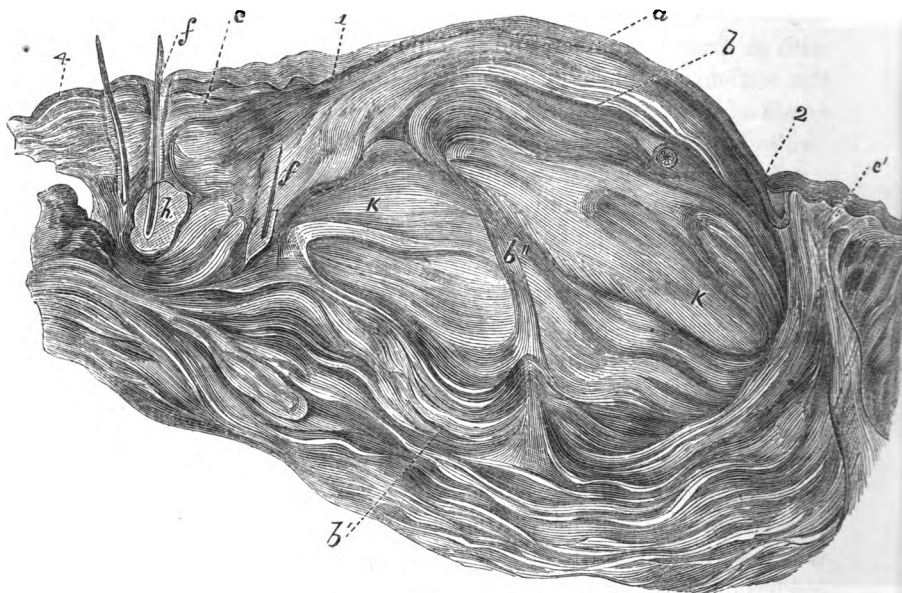
be seen to be more plentiful in the terminal processes of the keloid, where the fibres are also more separated from one another, and form a meshwork. These spindle-shaped cells are here arranged together more closely, and in several layers, on and in the walls of the vessels, and especially of the arteries. In the centre of the keloid neither vessels nor glands can be found. Superficial to and, more especially, beneath it, however, strangulated hair-sacs, with epithelial degeneration of their contents, sebaceous- and sweat-glands occur. The latter structures are met with in greater number, and in a more normal state, the more the sections are made in a direction towards the terminal processes of the keloid.

2. In cicatricial keloid.*

A scar 1" in length, 3" in breadth, elevated and firm, resulting from a wound from a fragment of glass, showed, when cut across, even to the naked eye, two kinds of structure. Immediately beneath the surface of the epidermis there was a layer of loose tissue $\frac{1}{4}$ " in thickness, which was convex towards the surface, and parallel with it—it could be traced continuously around the sides and deepest portion of the scar. It therefore occupied the outermost layers of the scar throughout its whole periphery, in the form of a ring, leaving a central, circular space quite free. The latter was occupied by a white, firm mass of tissue, discoid in transverse section and consisting of closely packed fibres—the keloid. Under the microscope (see fig.) there was discovered, in the middle line of a section of the scar, an epidermic layer, which was deeply pigmented in its deeper layers, and which lay immediately on the coarsely-meshed, fibrous layer, about $\frac{1}{4}$ " in thickness. The papillæ were entirely wanting here. Beneath this layer, and sharply defined from it, as well as from the wide-meshed fibres surrounding it in the form of a circle, lay the disc, which was made up of fibres packed closely together. The fibres appeared in part cut across

* It is important to take for examination a keloid-like scar, the nature of which is clinically established. A house-painter, who was subject to epilepsy, was thrown from a ladder during one of his attacks, and received three wounds, from fragments of glass, on the left side of the neck, just under the jaw. The anterior and posterior had healed over, leaving smooth scars, but the middle one presented a cylindrical scar 1" in length, 3" in breadth, and elevated to the same extent above the level of the skin. This I cut out and examined microscopically.

transversely, partly, however, under various acute angles, so that they were arranged side by side, like the barbs of the vane of a goose feather, a whitish line being traceable between the two rows of obliquely situated fibres. Moreover, the disc appeared split up by similar lines into several sectors, so that, taken as a whole, the fibres towards the axis of the disc had a loop-like form. Within the disc of compact fibres, there were



CICATRICIAL KELOID.—Vertical section. 1—2, scar, showing at *a*, a thin epithelial layer which rested evenly (without papillæ) on *b*, the scar-tissue; 1—4 and 2—3, normal skin, showing at *c* *c'* slender papillæ; *k* *k'*, the keloid imbedded in the scar-tissue, *b* *b'*; *b''*, a band of scar-tissue uniting the upper and lower segments of the scar; *f* *f'*, hairs; *h*, a sebaceous gland. (Hartnack, ocular 3, object. 4.)

hardly even small meshes to be discovered, very few nuclei, no distinct vessels, and no glands. The fibres of the central disc were less markedly tinged with carmine in the preparations than the fibres of the proper scar-tissue and of the corium, superficial to it and surrounding it in the form of a circle. Proceeding in a direction from the middle line of the cicatricial tumour towards either border, the epidermic stratum, the rete, the papillæ, the sweat- and sebaceous-glands appeared quite normal. The latter,

however, where they bordered on the disc of keloid, were pressed to the side, or, here and there, quite indented. In longitudinal sections, which were carried from the centre of the excised tumour into the healthy skin, one saw, at a certain depth, the densely fibrous keloid tissue, the mass of which was thickest in the centre of the scar, tapered towards the periphery, and terminated conically in several processes, between which were situated bands of connective tissue, with wide meshes. The fibres of the keloid ran, for the most part, parallel to the surface. Over the central, thickest portion of the keloid was a layer of fibrous tissue with coarse meshes, and upon this, without the interposition of papillæ, was the layer of epidermis. Over the peripheral portion of the keloid, however, not only was the layer of corium thicker, but the papillæ and their epidermic covering appeared normal. The hair follicles and the sweat-glands were much more frequently interrupted in one place or another, and the former filled with epidermic contents, in the region of the thick bands of fibrous tissue of the keloid, which had a horizontal direction. In the extreme periphery of the latter, they were of normal appearance. Beneath the keloid there was a considerable layer of coarse corium-tissue, imbedded in which were sebaceous glands, coils of sweat-glands, and the lower portions of hair follicles.

If we summarise the results of the examination of the keloid-like scar, the essential points would appear to be that—

1st. In the middle line there was a superficial scar denoted by the absence of papillæ, since the thin epidermic layer rested immediately on the coarsely-meshed cicatricial tissue.

2nd. An undoubted keloid, judging from its appearance, structure, and position, which, especially in transverse sections, was distinctly marked off from the cicatricial tissue surrounding it, and which it thrust aside. A longitudinal section showed, further, that the keloid, in the form of a spindle-shaped mass, was not only situated beneath, or, properly, in the scar (at the place where the papillæ were absent), but also, as regards a large portion of its body and processes, had penetrated for some distance into the healthy, non-cicatricial corium, which was consequently furnished with normal papillæ and glands.

We have here, therefore, an undoubted combination of a keloid with a scar, and it is consequently quite reasonable to designate this growth as Cicatricial Keloid.

Wholly different from those of the two forms just described are the microscopic conditions present

3. In the hypertrophied scar.

Here, as in all scars; there is only a thicker or thinner epidermic stratum, whose deepest, most highly pigmented layer rests immediately on the subjacent tissue. The papillæ are wholly wanting. The scar itself consists of a fibrous felt, the bundles of which form an irregular network, since broad and narrow bands cross one another in the most varied directions. Further, whilst some parts are distinctly fibrous, others are much less so, or almost homogeneous. Great numbers of round, spindle-shaped, and stellate cells, with large nuclei (inflammatory cells and connective-tissue corpuscles), are scattered about. The great abundance of blood-vessels is also remarkable. They, in part, are still pervious, with thickened walls, and pass insensibly into the adjacent fibrous tissue, and, in part, in older scars, become converted into rigid, white cords, infiltrated with a quantity of pigment, and which still show their origin from vessels by their form and branching course.

The Histogenesis and Histological Significance of Keloid.

As Follin,* Langhans,† Warren, jun.,‡ had previously shown, and as I have just stated, in the region of the sclerosed keloid tissue we find distinct, nucleated, spindle-shaped cells, which are, however, especially numerous in the peripheral parts, that is, the processes of the keloid. Here they are often arranged in several layers, which lie in and on the walls of the vessels, especially of the arteries, and thus surround the latter as spindle-cell sheaths.

The view propounded by the above-named authors, that the dense fibrous tissue of the keloid is produced by the organised combination and metamorphosis of these spindle-cells, imbedded in the arterial adventitia, is therefore quite reasonable. The wider these fibrous sheaths, and the more rigid they become, the more are the vessels enclosed by them compressed and obliterated. The vascular cords, however, always determine the direction of

* 'Gazette des Hôpitaux,' 1849, 75, 76, und 78 (Schmidt's Jahrbuch., Bd. 69, p. 207).

† Virchow's Archiv, 40 B., p. 332.

‡ Loc. cit.

the axis of the fibres which originate in their neighbourhood. As the greater part of the vessels of the stratum vasculare cutis run parallel to the surface of the skin, the predominance of this direction in the course of the fibres of the keloid is easily understood. Since many vessels, especially belonging to the deeper layers, ascend obliquely, or at right angles, the fibres formed along the latter will take a corresponding direction, and will cross the first ones. Hence the appearance, here and there, of a very dense network, to which also the displaced fibres of the corium contribute their share.

In the early stages, therefore, keloid is still very rich in spindle-cell elements (Follin, Rokitsky; immature connective-tissue elements), and it would appear that, at this stage, a cure of the disease is possible, though it could only occur by the absorption of these cells. At least, this is the only way in which we can explain the cases observed by Alibert, Hebra, and others; in which several patches of keloid, after existing for some time, spontaneously disappeared completely.

In the course of the further development of the keloid, the fibres not only become more numerous, and, therefore, more closely packed together, but they also become more rigid, sclerosed, and, by their being felted together with only small intervening meshes, they form a mass of tissue creaking on section with a knife, scantily supplied with blood, of a glistening, tendinous, white appearance, and tolerably sharply defined from the surrounding tissue of the corium into which it has penetrated as a foreign substance.

If, therefore, the tumour described may, in its early stages, owing to the abundance of spindle-cells present, be referred by some (Follin, Virchow) to the sarcomata, it certainly may, in the later stages, owing to its dense fibrous network, have the appearance of a fibroma to others (Wutzer,* Virchow). Indeed, such a view is justified by the fact that, by its enormous growth, the keloid sometimes may attain a conspicuous size, and may form a fibrous tumour even larger than a fist.†

* Deutsche Klinik, 1851, p. 148.

† From this point of view, the tumour from a negro's skin which I have described as a fibroma in the 'Med. Wochenschrift,' 1869, No. 1, may originally have been a keloid. Virchow, also (Geschwülst., ii. Band, p. 242), regards some of the keloid growths as sarcomatous ("Sarcoma of Scars"), and others as fibromatous; we cannot, however, from a clinical

The preceding account of the histology of the disease will have shown that—

1. Keloid is a peculiar growth distinct from a scar, and, more especially, from a hypertrophied scar; and, that

2. Keloid may occur, in a characteristic form,

- (a) In an otherwise unaltered corium having particularly a normal papillary layer—as *spontaneous* or idiopathic keloid; or,

- (b) It may be developed beneath and round about a scar—as *cicatricial* or consecutive keloid.

So far, therefore, as the distinction by means of microscopic examination is available, it affords no inconsiderable aid to the diagnosis of keloid. But, an anatomical examination, inasmuch as it presupposes an operation on the patient (excision), cannot always be conveniently carried out, and fails, for the most part, to be of any practical use. It, therefore, remains very desirable to obtain a sure means of clinical diagnosis apart from this. Unfortunately, this requirement cannot be fulfilled in any sufficient measure.

Clinically, idiopathic keloid and cicatricial keloid present the same features as a hypertrophied scar, and to make a distinction between them is not at all, or only under certain conditions, just possible. As is the case in many other processes, the whole of the symptoms must be taken into consideration in order to arrive at a just conclusion. For instance, the situation and arrangement of the tumours. If, for example, several such tumours are situated on and parallel to the sternum, they are, more probably, of the nature of keloid than hypertrophied scars; whilst keloid-like tumours beneath the jaw, for instance, are rather to be considered as cicatricial tumours, more especially if other flat scars are present near them. This circumstance is not, however, to be thoroughly depended on, as the examination of my case given above, p. 283 (cicatricial keloid from this very region), shows, since a keloid may be imbedded in the scar itself. For the latter reason, even a scrupulously precise previous history affords no satisfactory aid.

We may always be certain of this, however, that a hypertrophied scar never spreads superficially beyond the limits of the existing loss of substance, whilst keloid invades the adjacent point, follow him so far as to wish to associate canceroid growths with keloid.

cent healthy corium, transgressing those limits. By a careful examination, we may also eliminate those cases in which the portions of skin adjacent to a hypertrophied and strongly retracted scar become drawn together in the form of elevated tumours, as usually occurs, for instance, after excavated ulcers.

It is important, as far as possible, to come to a right decision on this matter, taking into consideration all the points mentioned, for the sake of the prognosis and treatment.

PROGNOSIS.

As far as our own experience and the statements of others justify us in expressing an opinion, the prognosis of keloid, whether of the idiopathic or of the cicatricial variety, is not favourable. We have already mentioned that, in certain cases, a spontaneous involution of one patch, or even of several patches, of keloid has been observed. Some have also been fortunate enough to remove keloid by cauterisation (Pick), or excision (Schuh, Salzer, and others), without any return taking place.

The possibility of such an occurrence must obviously not be wholly set aside, after the experience mentioned of spontaneous involution taking place. But success obtained in this way can only be established beyond doubt when it has been shown that the case operated on was really one of keloid, and when opportunity has been afforded of examining the patient many months afterwards. As a rule, such patients are lost sight of.

General experience points the other way, however, that keloid obstinately returns repeatedly, in the same place, after excision, even when a considerable portion of the surrounding healthy skin and the subcutaneous cellular tissue has been removed. And the keloid which develops subsequently is of relatively much larger size than the one excised. Even a second or third operation is without avail, as a rule, and the final event is that a much larger keloid results than that which was originally present. The cicatricial keloid which I removed from the submaxillary region of the patient mentioned above showed unmistakeable evidences of return, as early as four weeks after the operation.

Hypertrophied scars, on the other hand, as will be shown in

the following chapter, admit, in most cases, of improvement by appropriate treatment.

TREATMENT.

After having mentioned the unfavourable risks attending excision or cauterisation of keloid, we cannot, properly, recommend such a procedure. On the contrary, it is better to reveal to the patient the disagreeable prospect that, instead of the keloid, which has been removed by the cautery or the knife, a much larger one may become developed, and the deformity and inconvenience may be correspondingly increased. If, in spite of such advice, the patient insists on the operation being undertaken, then the operator cannot be charged with the eventual want of success. Energetic and long continued paintings with tincture of iodine, glycerine of iodine, the application of iodine ointments, of mercurial plaster, and various other remedies, have proved just as ineffectual in the way of treatment.

If, however, we desist *a priori* from any attempt to remove the keloid, there is yet another direction in which we not unfrequently are called upon to afford a means of relief, that is, in order to diminish the very tormenting pains which may exist. As the latter only occur transitorily, as a rule, the patients have frequently discovered, by experience, some remedy or other which gives them relief, even before they seek medical aid. Some patients have faith in the application of cold, and others in warm cataplasmata. Chloroform, alone or with olive oil, oleum hyoscyami, and opiate salves usually also mitigate the pain. A plaster which, being laid on the keloid, keeps it warm, and possibly softens it, is often of advantage. Still more when it has been sprinkled over with powdered opium before its application; for instance, R. Empl. de Vigo, Emplastr. de Melliloto āā unc. semis. Malax. et extenso supr. linteam insperge pulver. laudani pur. scrupulum. For the relief of violent, lancinating, paroxysmal pains, local subcutaneous injections of hydrochlorate of morphia are particularly indicated. If the pains recur at short intervals, and in a typical manner, quinine should be given internally.

No other method of treatment of keloid than that of treating the symptoms is attended with any success.

CHAPTER XLVIII.

(CLASS VIII.—DIV. I.—CONTINUED.)

CUTANEOUS SCARS.

CUTANEOUS scars are growths which, in the first place, attract attention owing to the white (pigmentless), or somewhat pinkish, smooth, bald (without hairs and follicles), glistening, and dry condition of their surface, and which are distinguished by this, as well as by their uniformly dense texture, from the normal surface of the skin surrounding them on all sides.

Within the limits of these common peculiarities, however, the scars vary very much in regard to their form, appearance, condition, &c. The colour is dark or clear red whilst the scars are young, and becomes even bluish-red, cyanotic, or marbled when exposed to the influence of a low temperature. As the scars get older, the colour becomes paler and changes less with differences of temperature, and, finally, remains white constantly under all circumstances. The surface of the scars is glistening and smooth in the early period of their existence, occasionally, however, it may be scaly or divided into compartments by shallow furrows. There are no hairs on the scars, nor are there any of those regularly arranged elevations and depressions, and corresponding linear markings and furrows, which are peculiar to the normal skin; and, lastly, we miss also the fine pits of the normal skin leading to glandular structures (orifices of ducts of glands, pores). They are also dry (without secretion of sweat or of sebum).

The scars are either, in their whole extent, situated at the level of the normal skin, limiting them on all sides—normal or flat scars—or they are depressed somewhat below this level—true, atrophied scars, or they are elevated above it more or less uniformly, occasionally to the extent of several lines—hypertrophied scars. In the latter case they appear as linear, band-like,

styliform, cylindrical, roundish, nodular tumours, or as ridges and wrinkles upon the surface of the skin, or of flat scars; or in the most fanciful forms of firm tumours and ridge-like projections, looking as if knitted, reticular, stellate, joined together, and intersecting each other.

Scars are, further, either movable on the subjacent tissue, like the adjacent normal skin—free, movable scars—or they are united wholly or in part to the subjacent tissue, to the fascia, periosteum, or bones, and, in this case, are often drawn in so as to be funnel-shaped—fixed, adherent scars.

Significance of the Scar.—Definition.—A scar, as an acquired growth of tissue and foreign intrusion into the structure of the normal skin, undoubtedly represents a pathological formation. But it is distinguished from all other pathological textural growths in this, that it, of necessity, always depends on the same antecedent, that is, on a preceding loss of substance, and that it becomes developed according to physiological laws. A scar is, therefore, in this sense a physiological structure, and its full significance does not depend exclusively on itself as a fully-formed and independent structure (histology), but, for the most part, on its “history”; that is, on its dependence on a physiological antecedent and its development according to law; to a slight extent, also, on its consequences.

We must, therefore, study separately the histological conditions, and also the history of the development of the scar, and we shall find the character of the affection compounded of these two, and may be comprehended in the following definition.

The cutaneous scar is a growth which has arisen in place of a preceding loss of substance of the integument, and permanently compensates for it.*

Anatomy.

Scars consist of a felt of connective tissue more or less richly supplied with vessels and nerves, and are covered on the surface with a thin layer of pavement epithelium, beneath which there are two or three layers of polyhedral cells. So far, they resemble the general integument, but they also differ from it in several

* The scar-like patches of atrophy of the skin, described by us at p. 261 of this volume, which are known under the name of atrophic scars, are thus separated from the true scars.

very essential particulars. The epidermic layer passes in a straight line over the connective-tissue part of the scar; that is to say, there are no papillæ. The rows of conical projections and depressions formed by the latter on the normal skin are, therefore, wanting, as well as the corresponding indentations and conical depressions of the Malpighian layer. Occasionally, little nodular elevations, irregularly arranged, may be found here and there on the connective-tissue part of the scar. These, however, as regards their internal structure and, more especially, the arrangement of their vessels, cannot be identified with the papillæ. Scars are also deficient in the glandular elements of the normal skin, hair follicles, sebaceous and sweat glands. In the early period of their existence, scars possess a copious supply of vessels. For this reason they have a more or less uniform and intense bright or dark-red appearance. In course of time the greater part of the vessels shrivel up and, therefore, in microscopic sections, traverse the connective-tissue felt as solid cords richly infiltrated with pigment deposits. As the obliteration of the blood-vessels advances, the scars become paler, and old scars appear white and glistening. A few dilated and tortuous vessels sometimes persist in the scar. After many ulcerative processes, we find the scars surrounded by a circle of pigment belonging to the adjacent skin, and which disappears in course of time.

The flat and elevated (hypertrophied) scars are distinguished from one another, anatomically, only by the different amount of their connective-tissue felt, and not by the different arrangement of their elements. In the preceding chapter, p. 283, it has been already pointed out that cicatricial keloid is clearly distinguished from them, and no more need be said on the subject here.

Clinically, the greatest interest attaches to the various forms of hypertrophied scars described above, since these extend beyond the antecedent loss of substance, and consequently give rise to very considerable deformity and inconvenience. The flat scars may also, however, be very disfiguring and annoying. The first result will occur more particularly on the parts about the face, and the latter not only in these situations, and especially at the borders of the physiological openings, on the eyelids, about the mouth and nares, but also, pre-eminently, over any of the joints.

The tissue which forms the scars, therefore, is, in its earliest stage, of the character of the so-called immature connective tissue or mucous tissue, rich in juice, in vessels, and in cells, and delicately fibrillated. Later, the cells and vessels diminish in number, the fibres become stiffer and dry, they shrivel up and approach one another, and the cicatricial tissue, altogether, becomes shorter, and, at the same time, firmer and thicker; occasionally, however, it may become shorter and thinner, owing to partial atrophy. As a result of the continued shrinking of the scar, extending over months and years, the adjacent parts of the skin and other structures become drawn together. Cutaneous tumours are thus produced which project over the true scar and simulate a hypertrophied scar. Or, the structures situated further off may become distorted—and ectropion, narrowing of the nasal orifices, permanent flexion of the joints, &c., may be produced.

If, therefore, even the simple scar is of some importance, the hypertrophied scar is still more so, and we must, consequently, devote more attention to certain points in connexion with scars in general, looked at from a dermatological point of view. We will ask, for instance: Under what circumstances do scars become developed in connexion with skin diseases? Do certain forms of scars correspond to particular morbid processes, or, in other words, are there characteristic scars? Can they, under some circumstances, be averted, or, at least, can their excessive development be checked? Can we, in any way, exercise any beneficial influence on scars which are already thoroughly hypertrophied?

Scars result only from those affections of the skin which destroy the structure of the corium, or, at least, of the papillary layer.

For this reason, all skin diseases may be divided into two classes, which are essentially different from one another; those which leave scars, and those which do not; and the presence of scars whose origin may be referred to a morbid process still existing or passed away, is, consequently, an aid to diagnosis not to be underrated, as by it a whole series of skin diseases may be at once excluded.

All superficial inflammatory and exudative processes run their course without cicatrization; erythema, herpes, eczema,

psoriasis, pemphigus, lichen scrophulosorum and lichen ruber, variola in its slighter (superficial) forms of eruption, and syphilis; maculo-papulosa, and squamosa. On the other hand, scars may arise, exceptionally, and in isolated points, even in the course of the processes named, whenever, from a locally increased intensity of the morbid process, a portion of the skin, containing connective tissue, at least, therefore, the uppermost, the papillary layer, has been destroyed. Thus, for instance, cicatrization often occurs, even in herpes zoster.* Such spots can be discovered during the efflorescence of the vesicles; they are those which, in certain groups, or, indeed, often in all the existing groups, have hæmorrhagic contents instead of a clear, transparent fluid. After the vesicles have burst and the crusts have fallen off, the papillary layer, infiltrated with hæmorrhages, is exposed, and its uppermost layers become destroyed in the course of an, occasionally, very copious suppuration. Healing is then, of necessity, followed by cicatrization. These conditions can be studied most frequently, and, at the same time, most evidently, in variola. Hebra called attention to this some years ago. The anatomical tendency of the varioloid process is determined by the fact whether, as a consequence of it, a scar remains behind, or not. When the exudation occurs very superficially, so that merely the mucous layer is separated and lifted up with the epidermis, then, after the desquamation of the affected structures, which occurs later, healing (skinning over) may result without any scar. This occurs, mostly, in the slight forms of the variolous process, but also occurs, occasionally, in variola vera. The stigmata themselves betray their superficial character, since, as early as the fifth or sixth day of the disease, they are elevated considerably above the level of the surrounding portion of skin. In the severe forms of the outbreak, on the other hand, the exudation begins very deeply in the papillary layer. The stigmata can be distinctly felt, deeply, but they project very little. When, in the natural course of such eruptions, suppuration sets in, the papillæ will be partially destroyed by this suppuration, and a scar will remain as a necessary consequence.

It is only in this sense, that it is true that scars remain

* Hutchinson (Catalogue to Atlas, New Syd. Soc., pl. xxiii., p. 70) remarks that scars may *usually* be found after herpes zoster, if they are looked for.—Tr.

more frequently after the more intense forms of variola than in the slight outbreaks; inasmuch as, in the first, namely, more deeply seated eruptions occur than in the slight varicelloid forms; nevertheless, either the one or the other eruption may be situated so deeply that scars may result.*

On the other hand, scars are a necessary consequence of all mechanical injuries of the papillary layer and of the corium, which cause even their partial destruction. Thus, scratching with the finger-nails may cause scars if the destruction reaches the papillary layer, and it may then seem as if the scars were in direct connexion with a process which otherwise would not itself be followed by scars. Thus we see scars develop here and there in the course of eczema, which does not itself produce scars, simply and solely on account of deep excoriations, or as a consequence of secondary pustules and furuncles.

Caloric and chemical agents acting on the skin—burns and cauterisation—lead to the formation of scars just in proportion as the connective-tissue part of the skin, and therefore, at least, the papillary layer is destroyed. As these agents very often do not act uniformly, that is, not with the same intensity at all points with which they come in contact, they cause a very irregular cicatrisation. Whilst, for example, as the result of a burn, at some points only the epidermis is raised, and removed in the form of blisters, in other parts the papillary layer peels off, and, in others again, the corium wholly, or in great part; and, in the first situations, healing occurs without, and in the others with scars proportionate to the thickness of the slough caused.

The infiltrations of the corium which are peculiar to certain pathological processes, and which, by their degeneration, set up ulceration, as in syphilis and scrofula, and also the ulcerations which result from inflammatory processes, ulcera e dermatitide, e varicibus, on account of the destruction of tissue caused by them, result most frequently in cicatrisation.

Though, from what has been said, it is quite certain that, as a rule, scars must correspond to the preceding loss of substance, so that they appear proportionate to the latter as regards extent, configuration,† and thickness, yet from this relation, valid, as a

* We see from this that all the methods hitherto proposed, by which cicatrisation after variola can be prevented, are based on an erroneous supposition, and cannot be of any assistance in this respect.

† Swerchesky ('American Journal of Syph. and Dermatol.,' July, 1871),

rule, we cannot draw an inference applicable to all cases, as to the etiology or the character of the pathological process which lay at the foundation of the preceding loss of substance. In other words, there are, *sensu stricto*, no characteristic scars.

On this point Hebra has already expressed himself very strongly.* At the place quoted he says: "We need only point out that, for example, the scars resulting from small-pox resemble those following on acne as completely as one egg does another, and that no one is in a position, from the observation of an acne scar, to distinguish it from a small-pox scar. Whether I inoculate a man with vaccine lymph, or pus from a chancre, or produce a pustule with tartarised antimony—in each case a scar makes its appearance, which corresponds with the loss caused by the particular noxious agent, but we shall not be in a position to distinguish which scar was produced by the tartarised antimony, which by the pus from the chancre, or which by the vaccine lymph." "A similar condition is met with in the other so-called characteristic scars. Scrofulous scars, for example, are described as funnel-shaped, and crossed by ridges, whilst the scars of radesyge are recognised by their stellate ramifications, processes radiating from a centre. Experience teaches, however, also, that in consequence of wounds of the skin, for instance, gunshot wounds, where, owing to the process of cicatrisation, the skin and subcutaneous tissue have become intimately united to the periosteum, just such a funnel-shaped scar is produced, as if a scrofulous caries had originally preceded, and an ulcer of the skin had developed subsequently, and union with the periosteum had occurred, owing to its cicatrisation. Who has not seen perfectly stellate scars develop, in consequence of burns and scalds?"

Still it must not be said that we dare not and cannot draw certain inferences, which may possess a high degree of probability, and, occasionally, may be quite correct, from particular conditions of the scars themselves, their form, the condition of the surround-

from experiments on the lower animals, has come to the conclusion that the later configuration of scars is determined by the direction of cleavage of the skin demonstrated by Langer ('Zur Anat. und Physiol. d. Haut,' i. Spaltbarkeit d. Cutis, Sitzb. d. k. Ak. d. W., xlv. B., 1861); an opinion which has its analogy in the work of Wertheim ('Wiener med. Jahrb.,' xviii., 2, 1869), on the progress of ulcers of the skin.

* 'Wiener allg. med. Zeitung,' Jhrg. 1861, No. 2, u. 3.

ing parts, their number, localisation, arrangement, &c.—in short, from the union of many influences, which directly or indirectly affect the scars. Thus we know, for example, that after the application of certain caustics flat scars mostly result, and after others mostly prominent ones. The latter applies especially to cauterisation with sulphuric acid. If we meet with thick, prominent scars, taking the form and direction of streaks and stripes, such as would be caused by a fluid running down over the face, we shall not be unreasonable in supposing that the scars have resulted from cauterisation owing to sulphuric acid having been poured over the face, and we shall very often be quite correct. Not always, however, for other agents, for example, merely hot water, may give rise to the same forms of scars. Syphilitic ulcers spread, as a rule, in such a way that fresh infiltration occurs peripherally round about the degenerating and ulcerating infiltration, and, later, also undergoes ulceration. The individual nodules are, from the first, mutually arranged in the form of a circle. As the ulceration advances, the central scars come in contact, as do also the semicircular ulcers around them, as well as the new infiltrations situated at the extreme periphery. When, after complete ulcerative destruction of the latter, cicatrisation has ensued over the whole region, we can very often trace, in the scar, the characteristic progress of the process of ulceration described, that is, recognise the preceding syphilis. We find that the central scars are the oldest, and therefore white, the peripheral ones younger, and therefore sanguineous, and surrounded by an areola of pigment, and, at the same time, they run in convex, curved lines, whose separate segments correspond to former infiltrations or ulcers which spread peripherally. No absolute reliance can be placed, however, even on such prominent characteristics which so frequently come under our observation in this form, as, on the one hand, serpiginous-syphilitic ulcers often cicatrise in a different form, and, on the other hand, scars produced from other affections, for instance, lupus, sarcoma, epithelioma, even herpes zoster suppurans may have precisely the same form and appearance as those caused by syphilis.

The physiological process of cicatrisation exercises, however, a particular influence on the form and condition of the scar under all circumstances. For which reason we will consider it

in more detail so far as a more intimate acquaintance seems important to our special purpose.

The formation of a scar may be divided into two stages: 1st, the formation of granulations; and, 2nd, of the epidermis, or the true skinning over (or "scarring"). Both these processes may go on in a normal, or in some abnormal way, and therefore we shall treat of the formation of scars in connexion with both of these points.

A. NORMAL CICATRISATION.

1. *Formation of Granulations.*

After the tissue which has been destroyed by caustics, burning, or gangrene, or a morbid growth in the skin destined to disintegration (syphilitic gumma, lupus tubercles, &c.) has become separated from the surrounding normal tissues, by spontaneous disintegration, by cauterisation, or by excision, the formation, by the normal structures, of the so-called granulations or fleshy warts commences with the phenomena of inflammatory infiltration and suppuration.

A series of distinguished surgeons and physiological experimenters, such as Billroth,* O. Weber,† Thiersch,‡ and others whom we shall take the opportunity of mentioning subsequently, have studied very closely the processes taking place during the healing of a wound. Though the authors named differ variously from one another in the interpretation of individual processes, they, nevertheless, agree in their recognition of the actual conditions present. As the latter, only, are of importance for our purpose, we shall chiefly devote our attention to them.

When the wound has become "cleaned" by the separation of the necrosed portions of tissue, the formation of granulations is already in progress. It is associated with a discharge of pus from the surface. We may suppose that the pus-corpuscles

* 'Allg. Chirurg. Pathologie und Therapie,' 4 Aufl. Berlin, 1869, p. 73, u. f.

† 'Handb. d. allg. und speciellen Chirurgie von Pitha-Billroth,' i. Band, i. Abth., p. 268 et sequ.

‡ 'Die feineren anatomischen Veränderungen nach Verwundungen der Weichtheile,' in Pitha-Billroth's 'Handb. d. allg. und spec. Chirurgie,' i. Band, ii. Abth., 364 et sequ.

have "escaped directly from the granulation tissue and indirectly from the vascular loops of the latter" (Billroth); or we may regard the whole newly-formed layer of cells as one compact exudation product, in which two layers differing essentially from one another are to be distinguished, an upper "pyogenic," without, and a lower "plasmatic" layer, with plasmatic canals (Thiersch); the fact always remains unaffected, that the formation of granulations and of pus go on hand in hand.

It is still undecided whether the loops of new vessels, around which the granulations become developed, and which are, undoubtedly, very essential to the formation of pus, originate by the formation of pouches from the old ones, or by a process of budding from the same in the form of solid cones, which subsequently become hollowed out (Jos. Meyer; Granulationssprossen, Weber). Or in such a manner, that by "cells strung together and blended into a hyaline tube beset with nuclei" (Rokitansky, p. Anat., i. B., p. 193); or, by "the stringing together in rows of young, spindle-shaped cells, small channels enclosed between two borders" are formed, which join the old vessels, and subsequently become blood channels (Zeilenbildung, Weber). Or, by red blood flowing into existing channels of anastomosis in the connective tissue, as if into a new system of canals (Lehmann), or, lastly, by the endogenous formation of blood-corpuscles in the interior of cells and hollow structures, a repetition occurs, in some degree, of the embryonic process (Rokitansky, O. Weber, Billroth,* Stricker-Klein,† Stricker-Carmalt‡), and thus new canals conveying blood—blood-vessels—originate.

The granulations which are, at first, coarsely granular and firm, later (nine to ten days after the wound) finely granular, soft, and spongy to the touch, form, originally, around isolated convolutions and loops of capillaries. And, on account of the arrangement of the papillary loops, the corresponding granu-

* 'Untersuchungen über die Entwicklung der Blutgefäße,' &c. Berlin, 1856.

† Klein, 'Das mittlere Keimblatt in seinen Beziehungen zur Entwicklung der ersten Blutgefäße und Blutkörperchen im Hühnerembryo.' Sitzber. der k. Akad. d. W., lxxiii. Band. Märzheft, 1871.

‡ 'Ueber die Neubildung von Blutgefäßen in entzündeten Hornhäuten, W. Med. Jahrb., 1871, p. 428.

lations have been spoken of as imitations of the normal papillæ. The granulation itself, therefore, consists of a growth situated around a vascular coil. The growth is made up of a homogeneous or finely granular intercellular substance, in which oval, spindle-shaped cells with large nuclei, together with formed elements resembling pus-cells, appear to be abundantly distributed (Billroth, loc. cit., p. 26). The first two, probably, also, the intercellular substance, appear to lie at the foundation of the subsequent formation of connective tissue. The arrangement of the blood-vessels of the layer of granulations is of interest. They run in undivided trunks towards the surface, and form here, as injected preparations show, a rich net of vascular loops.*

THE FORMATION OF EPIDERMIS ON THE SCAR.

The growth of granulations and of vessels going on beneath the suppuration reaches its physiological limit when they have arrived at the level of the surrounding skin. So soon as this is attained the suppuration diminishes in normal cicatrization, and the formation of the epidermic covering, the skinning over, commences from the borders. "In association with shrinking of the vessels, and of the tissue of the granulations containing vessels, the superficial extent of the wound diminishes, and, at the same time, the skin surrounding it becomes drawn towards the centre. At the part where the skin and granulations meet, the secretion of pus becomes somewhat diminished; first of all, a dry, red border, about $1\frac{1}{2}$ " in breadth, forms, and spreads towards the centre of the wound, and, in proportion as this advances and covers the granulating surface, a clear, bluish-white border follows immediately after it, and is transformed (outwards) into epidermis" (Billroth, loc. cit., p. 76). This bluish-white border, advancing from the edges of the wound towards the centre, is made up of young epidermis, which allows the subjacent blood-vessels to shine through its thin layer with a bluish tint. At last, the whole wound is covered with epidermis. This consists, at first, of more polygonal, less flattened

* Billroth, loc. cit., Taf. ii., fig. 8. Thiersch, Pitha-Billroth's 'Lehrb. d. Chirurgie,' i. B., 2 Abth., 3 Abschn. Separatabdr., p. 32. Billroth-Czerny in med. Jahrb., xviii. B., iv. u., v. Heft., 1869, Sep.-Abdr., Taf. iii., fig. 16.

and nucleated cells, which are frequently shed. Later, they appear more flattened, are in thicker layers, and have a longer duration. The scar, therefore, appears of a bluish red tint so long as it is young. Later, in proportion as the epidermic layers covering it become thicker, and a greater number of its vessels and those situated at a greater depth shrivel up and become obliterated, it appears whiter, smoother, and shining. The scars continue to contract after a duration of many months and years, and thus occasion, secondarily, the various disfigurements already indicated above, consisting in a traction on, and distortion of, the adjacent parts of skin.

In regard to the mode in which the formation of epidermis occurs in cicatrising wounds, and the nature of the process, explanations, of a definite or only of a conjectural character, have been offered, especially, of late years, by (in part, at any rate) very distinguished observers and experimenters. These, however, differ so widely from one another on such essential points, in fact, are so opposed to one another, that any definitive decision on this important histological question is not to be expected for a long time to come. As, however, they have been founded not only on clinical, but also, in great part, on experimental evidence, and are, therefore, if only for this reason, of great value, it is necessary to ascertain the present bearing of these same views.

Clinical observation teaches that in the majority of the cases the skinning over commences in the manner above described, from the edges of the part where the loss of substance has occurred, that is, from the adjacent epidermic border. Not unfrequently, however, bluish-white isolated points and patches make their appearance in the midst of the granulating area, increase in size peripherally, and, having been originally central and distinct islands of epidermis, finally come in contact with the border of epidermis advancing inwards from the periphery. In addition to this clinical experience, which of itself is susceptible of, and has actually undergone, various interpretations, there is a whole series of experimental observations, on the foundation of which, three views, essentially different from one another, have been set forth.

1. According to the first of these it is simply and solely the connective-tissue basis of the granulations (of the corium) which

affords the epidermic covering. Either (according to O. Weber, loc. cit., p. 269) "the epithelium of the scars arises from the connective-tissue cells by a process of gradual enlargement, flattening, and lamination;" or, white blood-corpuscles migrate out of the stroma, that is, out of the vessels, and reach the surface, being there met with, under different forms, as the so-called wandering cells, and contribute to the formation of the epidermis in a manner which cannot be stated more explicitly, or may, perhaps, themselves be converted into epidermic cells (v. Biesiadecki,* Pagenstecher†).

2. The second explanation falls back, partly, on embryological data for support, that epidermis can only be reproduced from epidermis (Schroen,‡ Thiersch). Still, the views founded even on this common standpoint differ widely from one another. Thus, Schroen is of opinion that the various layers of the epidermis are regenerated from different sources. Like the normal epidermis, the epidermis which is regenerated after a loss of substance consists of three layers; the lowest, which is made up of cells of the rete Malpighii; an uppermost, the proper horny layer; and a layer, intervening between these two, composed of "sterile cells," which has been named by Oehl, stratum pellucidum. The stratum Malpighii, like the stratum pellucidum, which consists simply of the flattened cells of the upper Malpighian layers of cells, is regenerated from the Malpighian cells of the neighbourhood of the wound. We cannot conceive the uppermost horny layers, however, to be a product of the Malpighian layers, since the sterile layer of Oehl lies between the two. They proceed from the cells of the sweat-glands, or, possibly, from the glands of the hair follicles; since gland-cells make their appearance at the mouths of the gland follicles, and are arranged concentrically round the orifices. From the islands of cuticular laminæ corresponding to the mouths of the glands, therefore, are formed the horny layers which cover the whole of the scar by their peripheral growth, and, at last, by their mutual apposition. This,

* 'Beiträge zur physiol. und path. Anat. d. Haut,' Sitzb. d. k. Ak. d. W., lvi. B., ii. Abth., Junih. 1867.

† 'Ueber die Entwicklung der Epithelialzellen,' &c., Sitzungsber. d. k. Ak. d. W., lvii. B., ii. Abth., Aprilh. 1868.

‡ 'Contribuzione alla Anatomia, Fisiologia e Pathologia della cute umana.' Turin, 1865.

however, only occurs when the loss of substance has been so superficial, after burns and scalds, for instance, that the deeply-situated sweat- and hair-follicles have not been destroyed. In this case the whole epidermis would have to be regenerated. When such a loss of substance occurs that the glandular structures mentioned have been destroyed, there follows only a production of the cells of the Malpighian layer, whose uppermost layers become flattened and dried so as to form the stratum pellucidum. In this case, therefore, the latter supplies the place of the deficient horny layer. It is to this stratum pellucidum that the scars which result from deep losses of substance owe their peculiar shining, parchment-like surface. It is evident, at the same time, that, according to the statement of Schroen, the regeneration of the epidermis may take place, macroscopically, in a twofold manner. In the form of a cicatricial border advancing from the periphery (as regards the Malpighian cells and the layer of Oehl), and as islands of scar arising in the midst of the granulating area (as regards the cells of the horny layer).

Most observers are of opinion that everywhere it is only out of pre-existing cells of the rete that epidermic cells can be reproduced, but all authors are not equally agreed on the fundamental nature of the process. In fact there are two distinct quarters from which this formation of epidermis may proceed. In the *first* place, from the margin. "The external surface of the granulation becomes transparent, poor in cells, and non-vascular, the nuclei of the cells become elongated, the intercellular substance appears fibrous" (Thiersch). It is in this way that the transformation of the tissue of the granulations into fibrous, permanent, cicatricial tissue is characterised under the microscope. And now the formation of epithelium begins from the margin. "The soft layer of cells advances from the margin and becomes attached to the granulations, where they are traversed by plasmatic canals. The pyogenic layer appears to afford no attachment. When the adhesion between the epithelium and the plasmatic layer is established, the growth of blood-vessels soon reaches the under surface of the epidermis and penetrates into it in the form of loops. In this way the surface of contact, which was previously smooth, becomes very irregular, and the foundation is laid for the

formation of vascular papillæ" (Thiersch). We do not, however, mean by the latter, structures analogous to the normal papillæ, but merely a surface with warty elevations, like papillæ, resulting from an unequal depression of the epidermis into the vascular stroma of the tissue of the granulations, and from superabundant, nodular elevations of the latter. The manner in which the new epithelial cells originate from the Malpighian cells at the margin, that is, the intrinsic process of the epithelial regeneration, has been variously represented. According to the view generally adopted, they arise from division of the nuclei and cells of the old ones—a process which has great probability in its favour, as, in cases of abundant, pathological formation of epidermis, in pointed condylomata, and in Ichthyosis hystrix, for example, various changes occur in the epithelium, which are to be attributed to the division of nuclei and cells (v. Biesiadecki, Pagenstecher, Kaposi (Moriz Kohn), Losterfer, &c.). According to others (J. A. Hoffmann*, Wadworth and Eberth†, Stricker-Heiberg‡, whose statements refer, first of all, to the processes which occur in the cornea), the new epithelium arises from the periphery by the marginal epithelium sending out offshoots, which (being each provided with a nucleus), presumably, are detached from the mother-cells, and become independent young epithelial cells, and, in their turn, give origin to fresh young epithelial cells by a process of budding. In the *second* place, islands of epidermis may arise in the midst of the granulating surface from cells of the rete, which, in cases of superficial destruction of the skin may have been left behind, as remains of the lowest parts (apices) of the Malpighian cones.

3. J. Arnold§ is the originator, and as yet the only advocate of a third view (really identical with the old theory of the independent formation of cells from blastema), according to which the new epithelium arises from a mass, which is, at first, cloudy and finely granular, but, subsequently, becomes as transparent as glass, and which (in experiments on the tongues of

* Epithelneubildung auf der Cornea, Virchow's Archiv, B. li., 3, 373-390.

† Die Regeneration des Hornhautepithels, *ibid.*, 361-372.

‡ 'Stricker's Studien aus dem Institute für experimentelle Pathologie in Wien,' aus dem Jahre, 1869. Wien, 1870; und 'spec. med. Jahrb.,' 1871, p. 7.

§ Virchow's Archiv, B. xli., p. 168, Taf. vi. vii.

frogs and on the cornea) fills up the void left by the loss of substance, and becomes split up into nucleated epithelial cells. Arnold's statement has not been substantiated by the authors just named, nor by Billroth.

If we collect together the essential results of the investigations of the last few years respecting the regeneration of the epithelium, we shall find that—

1. A few, only, ascribe* to the connective tissue a direct, though not exclusive, participation (by migratory cells, v. Biesiadecki, Pagenstecher) in the development of the epithelium.

2. That J. Arnold, alone, considers that the epithelium originates from a free blastema.

3. That most authors attribute the origin of the new epithelium to the pre-existing epithelium.

According to the latter view, the formation of new epithelium (and, therefore, the final skinning-over) can only commence from the epithelium, at the margin of the loss of substance. As an exceptional circumstance, however, islands may form in the area of the loss of substance. The latter would imply that, at these points, epithelial structures of older formation are present, either in the form of the epithelial linings of the sweat and sebaceous glands (Schroen) or of the lower extremities (apices) of the cones of the rete. Though Arnold saw islands of epithelium develop (on the palate of dogs) after supposed complete removal of the mucous membrane, yet this positive statement does not exclude the possibility of a remnant of epithelium being left behind, and it becomes of still less value from the fact that it has not been substantiated in other quarters (Billroth).

We will now ask what relation clinical experience bears to the results of microscopic investigation, and of experiment in regard to epithelial regeneration?

Clinical observation teaches that after any loss of substance healing commences invariably and uniformly from the margin and advances towards the centre; and that it is only exceptionally, and in an irregular manner, that cicatrisation can commence from central, isolated spots of epithelium and spread peripherally. From these scattered islands of epithelium, disconnected from

* Even the islands of epidermis which arise in the centre we may conceive to have originated from cells which have migrated there, and then taken root.

the marginal layers of epithelium, the formation of epithelium does not, however, advance beyond a certain extent, somewhat exceeding the size of a sixpence, for it then comes to a stand-still; whilst the epithelial border, spreading from the periphery, reaches, as a rule, as far as the centre, that is, accomplishes a complete healing of the wound. It is only in exceedingly large wounds that even the peripheral border of epithelium remains at a greater or less distance from the centre of the wound. Experience teaches, further, that the central islands of epidermis, spoken of, only arise in those cases in which there is reason to suppose that the destruction of tissue has penetrated to unequal depths, for example, after a burn; and in which, therefore, the deepest layers of the epithelial cones, or of the glandular structures, may have remained wholly unaffected.

So that, both as regards the peripheral, epithelial margin and the islands of epithelium within the area of the wound, the view which receives the greatest support from clinical experience is that the newly-formed epithelium originates from epithelium of older formation.

Although, on the other hand, clinical experience gives no direct support to the view (advocated by O. Weber) of the direct participation of the connective tissue, or of an indirect participation of it (connective-tissue corpuscles) and its vessels (by means of migratory cells) in the regeneration of epithelium; yet it appears highly probable that the connective tissue and vascular substratum do exercise a very essential, *i.e.*, at least a nutritive influence.

The best evidence of this is obtained from the processes taking place in artificial, so-called, "Transplantation" or "Grafting" of epidermis on granulating wounds, which, according to the statement of See, was first tried by Reverdin,* and, subsequently, was carried out by many others, Pollock, Dobson, Lawson,† Heath, Arnott, Durham, Johnson Smith, Bellamy, Clarke, and, here in Vienna, by Czerny,‡ Menzl, ourselves,§ &c

* 'Gaz. des hôpitaux,' 1869, No. 2, u. 4.

† 'Medical Times,' 1870, 1061 and 1071.

‡ 'Centralblatt,' 1870, No. 17.

§ At the meeting held on Feb. 17th, 1871, I demonstrated a successful case of transplantation of epidermis. See the account of this, and of the discussion which followed, in the 'Anzeiger der Ges. d. Aerzte,' 1871, No. 7.

As yet, indeed, with the exception of a case noted by See,* wanting further confirmation, and one by Fiddes, the successful adhesion of transplanted epidermis has only resulted when more or less of the connective tissue and vascular substratum, at least, therefore, a portion of the papillary layer, was removed, and transplanted at the same time. And the adhesion and reproduction of the epidermis, the formation of islands of cicatrisation, had been successful in proportion to the amount of the tissue of the corium itself, which was removed at the same time.†

The facts quoted, as well as certain microscopical conditions which indicate an intimate connexion between the epidermic stratum and the stroma of the papillary layer, but which do not appear to require further explanation here, do not permit us to form too low an estimate of the importance of the connective tissue and vascular stroma in the regeneration of the epidermis, even though the view adopted by most authors be exclusively the right one, that epithelium can only be reproduced from epithelium.

b. *Abnormal Cicatrisation.*

Cicatrisation may proceed abnormally in a twofold manner, since it may, in various ways, be either deficient or excessive.

It is deficient, that is, protracted, or, indeed, permanently prevented, owing to the formation of granulations being disturbed in various ways, which, also, interferes with the formation of the epidermis; or the latter, alone, suffers delay or interruption.

The first, again, shows itself in various ways. The granulations appear but incompletely papillary, they form a flat surface, which, instead of being vividly coloured, is of a brownish-red tint, finely granular, secretes a little, thin, serous pus, and, frequently, owing to drying-up of this secretion, appears as if smeared over with thin varnish, dry, glistening, and iridescent. Or, the surface of the wound thus furnishing such a scanty, glutinous, and serous secretion, obtains and retains a shining, oily appearance, or its upper layers break down into a fatty,

* 'Gazette médicale de Paris,' 1870, No. 26.

† Alex. Jacenko (Kiew), 'Ueber die Transplantation abgetrennter Hautstücke,' Med. Jahrb., 1871, p. 416. 'Luigi Amabili, L'innesto epidermico e la trasplantazione cutanea nella cura delle piaghe,' Napoli, 1871.

greasy pulp. In this stage of indolent condition, having the varied external appearance mentioned, the surface of the wound may remain for weeks or months without markedly altering its level, and without cicatrisation taking place from the periphery inwards. At another time, the granulations have shot forth luxuriantly but are easily lacerated, bleed freely and frequently, and, from time to time, hæmorrhagic effusion takes place into them, by which they become chiefly of a bluish-red colour, degenerate, shrivel up, decay into shreds, and are cast off. By these occasional hæmorrhages the healing of the wound is delayed for a long time. Frequently the abundant granulations are dropsical, soaked with fluid, swollen out, of a pale rose-tint, and transparent. This sort of granulation does not favour the occurrence of cicatrisation. Such granulations do not afford a sufficiently firm support for the advancing border of epidermis, and are themselves easily liable to destruction. A remarkably diminished, or, on the other hand, an excessively increased sensitiveness* of the granulations is to be regarded as an abnormality of cicatrisation, in the sense of being a cause of delay. Healthy granulations should be sensitive to the touch but not painful.

The formation of epidermis from the margin inwards may be prevented, or, if already begun, may be hindered in its progress, if the granulations are abnormal in one or the other of the ways above mentioned, or if the wound is too extensive; or it may be prevented by processes going on at the margin of the wound itself, if, for example, the margins of wounds which have existed for a long time have become callous. Occasionally it is interrupted, owing to the fact that extravasation of blood occurs around the margin of the wound, and any margin of cicatrisation which may have formed already is raised up. In very extensive wounds, however, the formation of epidermis is checked by contraction of the peripheral cicatricial tissue, which has existed for some time, the contraction causing, at the same time, a compression of the afferent vessels. The older the peripheral, cicatricial tissue is, absolutely, that is, the more slowly the cicatrisation proceeds, as a whole, and, therefore, the

* Rindfleisch ('Lehrb. d. path. Gewebslehre,' i., § 106, Leipzig, 1871) has shown that such "irritable" granulations are very copiously supplied with nerves. New Syd. Soc. Transl., vol. i., p. 128, sec. 106.

larger the wound and the more frequently cicatrisation has been interrupted by the accidents above mentioned, the more frequently, also, may the disturbance last named come into play. In fact, it may be said that there is here a *circulus vitiosus*, for, alternately, the cause becomes the effect and the effect the cause. Even scars which are completely skinned over may be destroyed, partly or wholly, by hæmorrhage occurring beneath the new epidermic covering, in consequence of pressure or traction, and elevating it in the form of bullæ with sanguineous, serous contents, or it may happen that bleeding lacerations, or a complete detaching of the young cicatricial tissue may be produced.

In the other direction, that is, in the sense of excess, cicatrisation may be abnormal, if the granulations grow beyond the level of the adjacent parts (*caro luxurians*). This is a hindrance to the formation of the epidermic covering in most cases, at all events, or for a time at least. The new border of epidermis mounts for a certain distance on the margins of the luxuriant granulations, but does not completely cover them. In cases in which a return to the normal condition occurs, the granulations shrivel up beneath the epidermic border and become flattened, and, in the same proportion, the epidermic covering advances a little further, so that, at last, though delayed, the cicatrisation becomes complete, and the scar becomes flat, in spite of the previous luxuriance of growth. Occasionally, however, if the granulations, owing to the process of cicatrisation being protracted, have had time to develop into well-formed connective tissue, tumours result, which are elevated above the level of the surrounding skin, and represent the so-called "hypertrophied scars." Anatomically, these cannot be distinguished from the normal, flat scars.* In very rare cases, it may also happen that well-formed, flat scars, such as are covered with a permanent layer of epidermis, subsequently develop into tumours, and are elevated above the general level, and, therefore, are converted into hypertrophied scars. After cauterisation of lupus I have seen perfectly flat, inconspicuous, well-formed scars result, and then, to my great dismay, have found these converted into unsightly, hard, tumour-like, prominent scars, within the space of a year. As, however, these remarkable cases were not available for microscopic examination,

* See p. 285 of present volume.

I cannot say whether the subsequent tumefaction was based on a simple hypertrophy of the connective tissue, or on a mere arching forwards of the upper part of the scar, in consequence of contraction of the deeper parts, or, lastly, whether it depended on the development of a keloid in the scar, as I have explained in the foregoing chapter.

Causes of Abnormal Cicatrisation.

In reference to delayed cicatrisation, there are frequently, though not in all cases, sufficiently plausible causes to be assigned. It is not so, however, as regards the increased formation of scars. We can here only point them out, rather than treat exhaustively of them, as they properly belong to the domain of general surgery.

We may regard the causes which delay or arrest cicatrisation, in one or the other of the ways described, as, first, constitutional; and, second, local.

The first depend on a peculiar condition of the system which is designated as Anæmia, Cachexia, Scrofula, Marasmus, or feverish excitement (Pyrexia), according as its character varies.

Individuals who are anæmic, from any cause whatever, whose state of general nutrition is impaired, very often show a diminished power of healing, as regards any wounds which may exist, for the granulations either pass into an abnormal condition in the manner formerly described, or the skinning-over does not proceed properly. Persons suffering from dropsy, from whatever cause, are very liable to have dropsical granulations on any wound, and those with a tendency to scurvy—drunkards, and really scorbutic persons—are subject to disturbances of their wounds, which are frequently occasioned by hæmorrhages. In the same way wounds take on an unhealthy appearance almost invariably during any febrile excitement of the body, even though the fever is set up by some influence unconnected with the wound, and, therefore, without gangrene or erysipelas being imminent. In proportion as the anæmia, the general marasmus, &c., diminish as the state of general nutrition improves, and as the fever declines, we often perceive a progressive improvement in the healing of the wound. It cannot be shown, however, that there is any special general dyscrasia which delays the healing of wounds, since it is a sufficiently common occurrence,

even in well-nourished individuals, for wounds to heal badly, whilst in other cachectic persons the contrary occurs. The constitutional dyscrasia of syphilis has no directly injurious influence on the healing of wounds, since, in syphilitic persons who are well nourished, wounds heal as well as those of other persons who are correspondingly well nourished, provided that the wounded portion of skin does not happen, at the same time, to be the seat of a syphilitic infiltration (Papel, Gumma) which is liable to suppurative destruction. It is only when syphilis has produced a general marasmus that the healing of wounds is affected injuriously, and then only in consequence of the latter.

The local causes of retarded cicatrisation may be either organic or mechanico-chemical.

To the first belong suppurative and inflammatory processes in the neighbourhood of the wounds, caries, and necrosis of the subjacent bones. To the last, blows, kicks, pressure, and friction from clothing and bandages, stretching on movement, injuries from scratching, not infrequently rough handling in dressing, careless treatment of the wound generally, in which, for example, the formation of scabs, and the collection of pus under them is allowed, unsuitable applications (water, salves, plaster), which may be too irritating, or even destructive, &c.—in short, a countless number of influences which must be pointed out in each particular case, and can here only be noticed in the forms most frequently met with.

As regards the excessive formation of granulations, and the origin of hypertrophied scars, there are much less reliable explanations to be adduced. Undoubtedly want of skill and inefficient treatment lead, directly or indirectly, to the same. Often, however, the conditions are such that we can attribute it to nothing else than an individual predisposition, since in certain individuals hypertrophied scars arise under any circumstances.* In no case, however, should we attempt to hide our ignorance in this respect by the acceptance of such explanations as "errors in the mode of life," or even "a few glasses of beer more than usual," "the cold night air," and similar commonplaces, as authors in other respects reliable enough have done.

* See p. 277 of present volume.

Subjective Symptoms.

The subjective sensations caused by the granulations during cicatrisation, as well as by the fully-formed scar, are so inconsiderable that they would not require any special attention here, were it not that occasionally they become more noticeable, owing to certain departures from what is normal.

We have already mentioned once before, in the preceding account, that "healthy" granulations possess a certain degree of sensitiveness to external irritation, to the touch in particular, but this is very far removed from "being painful." In many cases the granulations are but very slightly sensitive to the touch, torpid; occasionally, indeed, they may be wholly without sensation. Diminished sensitiveness on the part of the granulations is itself not at all a hopeful symptom as to their vital energy, but complete insensibility is an almost certain forerunner of mortification. Increased sensitiveness of the granulations may also often be a valuable indication of an abnormal course. This painfulness, which is sometimes very troublesome, producing violent outcries on the lightest touch, or even after the application of exceedingly mild dressings, is frequently confined to isolated points, and may, in this case, or where the whole surface of the wound is affected, be present only at the commencement of cicatrisation, and may disappear in a few days. At another time, however, it only ceases when the sensitive granulations have been destroyed, either spontaneously or artificially, and have given place to a new generation of granulations. In such cases, therefore, an unfavourable significance attaches to the abnormal sensitiveness of the granulations as regards prognosis. At the commencement and in the course of the cicatrisation of wounds of the skin, an itching sensation is often produced in the immediate neighbourhood. Laymen and physicians have been inclined to consider this sense of itching as a hopeful prognostic, but that it is not really so is proved by the fact that it is not by any means absent in cicatrising scars just before spontaneous disorganisation.

Completely formed scars are, normally, not in any way specially sensitive. Stretching or mechanical irritation of any sort may, of course, make them painful. Many persons, however, complain of moderately severe drawing, tearing, pricking,

radiating pains which they feel every now and then in scars. That the persons affected very often connect such a periodical painfulness of their scars with actually existing, or merely supposed, changes in the "weather" is as well known as the precarious value of the "weather wisdom" so founded, and so often contradicted by facts. Much more importance is to be attached to those neuralgic affections which come on in many scars mostly in the form of paroxysmal pains of various kinds, burning, &c., and which either remain stationary there or spread thence along the corresponding nerve-trunks and their branches, and either take the form of severe neuralgic attacks radiating centrifugally, or, being propagated centripetally, irritate the central nervous system, and, by affecting large tracts, either set up general disturbances of the sensorium, or convulsive attacks, trismus, or tetanus, and in the latter form may even endanger life.

Treatment.

If cicatrisation is proceeding normally, it would appear that the mode of treatment adopted is tolerably indifferent, and without influence, provided that it is rather of a mild than a heroic character. This is shown by the methods of treatment, often of the most opposite kinds, which have been adopted from time to time. Thus at one period the hermetical exclusion* of air from wounds, at another, their intentional exposure to it; dressing with little or much, or continuous washing (irrigation) with grease, salves, and lotions with and without the addition of

* As a good excluding and disinfecting dressing, carbolic acid (Lister) has been much used of late years, and with good results. Lister's dressing consists in the application of charpie soaked in carbolic oil (acid. carbolici drachmam, olei olivar. drachm. sex), which is covered over with a carbolic paste spread on tinfoil (acid. carbolic unc. semis, olei olivarum uncias tres, cretæ alb. pulver. quant. sat. ut fiat pasta mollis).

By the absorption of the carbolic acid from the surface of the wound, and its excretion with the urine, the latter appears now and then of an olive green, or even of a tarry black colour. (See my essay on the internal use of carbolic acid, &c., 'Arch. f. Derm. u. Syph.,' 1869, p. 222.)

With Lister's dressing, the granulations do not possess a "surgically" fine appearance. They are pale and very often dropsical, and too luxuriant. (For an account of Lister's later and greatly improved plans, see 'Bien. Retrospects.'—Tr.)

slightly astringent ingredients, wadding, charpie, &c., &c., have each, in their turn, been held equally important by surgeons.*

On the contrary, in abnormal cicatrisation treatment is advantageous, and appears desirable in two directions. In the first place, in order to convert the abnormal course of the cicatrising process itself, whether indolent or excessive, into a normal one. And, secondly, in order to remove or alter scars which are already formed and hypertrophied, so far as they are more disfiguring than a normally flat scar or interfere with function.

The means by which these objects can best be attained are sufficiently familiar to all medical men from general surgical principles. Indolent, torpid granulations may be excited by slightly stimulating applications, Unguentum Elemi, Unguent. Basilicum, slightly caustic remedies, &c. In obstinate cases it is advisable to destroy the whole surface of the wound down to the healthy tissue by means of some energetic caustic; caustic potash in substance, the Vienna caustic paste, nitrate of silver, arsenical paste, the hot iron, chloride of zinc, &c., so that a new, and, as may often be seen, a more active formation of granulations may begin from the healthy tissue. Exceedingly swollen granulations, which are about to become disorganised, are infiltrated with extravasations, bleed easily, or are even only very painful, may be advantageously destroyed, to a certain depth, by the remedies above mentioned, and will usually be followed by granulations in a normal condition.

When granulations have the characters above mentioned, slight cauterisations, which must, however, be frequently repeated, usually have the desired effect; dusting on powdered

* In reference to the influence of water on the formation of granulations and the healing of the wound, we can only say that the experience obtained in the surgical wards as to the employment of continuous irrigation, and the observations which we have had, and still have the opportunity of making, of the use of continuous baths, show it to be exceedingly beneficial. Even wounds in the worst possible condition, torpid, gangrenous, resulting from syphilitic ulcerations, following burns, decubitus, &c., have been treated by us by the continuous bath, and have then improved steadily till completely healed, becoming skinned over in a surprisingly short time. We lay particular stress on these facts, because they are opposed to the conclusions deduced from the microscopic observations made by Prof. Stricker some years ago, according to which the young granulation-cells are in great measure destroyed by the continued influence of water.

alum, painting with a concentrated solution of nitrate of silver (equal parts of the nitrate and of water), touching with a stick of nitrate of silver, the application of an ointment containing copper (two grains of acetate of copper to a drachm of Ung. Elemi), or a lotion of caustic potash (one or two grains to the ounce of distilled water), an ointment of red precipitate (two or three grains to the drachm), an ointment of nitrate of silver (nine or ten grains or half a drachm to the ounce, &c.), and the like.

We possess a valuable addition to our means of treatment of indolent wounds in the transplantation of epithelium and portions of skin, which has been already mentioned.* Strictly, we can only say that the method which was for long well known, but only practised and handed down as a curiosity, has now been made of more general importance owing to the impulse afforded by Reverdin's success. For, as has already been shown, the procedure does not consist merely of transplantation of epithelium, but also of a bit of skin. It had, however, been already noticed by surgeons of preceding generations, that portions of skin of considerable size, which had been completely separated either from the same individual or from another, might be made to unite with a wound. A new and striking addition to the therapeutic usefulness of this fact has been afforded by the modification introduced by Reverdin, by which even very minute particles of skin may be transplanted and made to unite with the granulations of the wound.†

The following is the method employed in transplantation:

After the surface of the wound has become freed from any dead, gangrenous, diphtheritic, or hæmorrhagic coating, and granulations are seen to be springing up everywhere, a portion of skin from ten to twelve lines in length, and one and a half to three in breadth, is excised, by means of scissors held flat, from any convenient part of the body, as, for instance, the inner surface of the thigh, and to such a depth that a little blood is seen on the cut surface. The excised portion of skin is then

* See p. 307 of present volume.

† Czerny and Billroth have also transplanted a portion of mucous membrane on to a wound of the skin, and witnessed, as a result, the interesting circumstance that the ciliated epithelium of the mucous membrane became converted into pavement epithelium.

cut up into fifteen or twenty smaller pieces without any especial choice or limit. The pieces are then placed on the surface of the wound separately at a distance of about three or four lines from one another. A sufficient number of portions of skin are excised to cover the surface of the wound when they are cut up in pieces and dispersed in the manner described. This method is a better one than that of taking the whole of the skin required in one piece from the same part of the body, because by the former plan, though losses of substance are caused at several places, they are very small and quickly heal over, whilst, by the latter procedure, a single large wound is produced, which may itself remain unhealed for a long time. The surface of the wound, which has been studded with these particles of skin, is now covered with sticking-plaster in order to prevent their falling off. The dressing of the sticking-plaster is only removed after five or six days, the wound dressed according to Lister's plan, and then cleansed several times daily at suitable intervals. In eight or ten days after the transplantation we notice here and there in the area of the wound, bluish-white, glistening points, which subsequently increase in distinctness and size, and ultimately, in the course of a fortnight or three weeks, are recognised as islands of cicatrisation. Each individual island increases to about two or four lines in diameter. By this means the isolated little plates come in contact, and, at last, form a complete cicatricial covering. A large proportion of the transplanted particles of skin always perish, however, without taking root, and occasionally the whole experiment fails. This is especially likely to happen when there are no healthy granulations on the surface of the wound to be covered. The transference of larger portions of skin is much more certain of success.

The best indication for adopting this method of transplantation is afforded by wounds whose edges are callous (old ulcers of the leg), and which, therefore, are scarcely capable of sending out an epithelial border from the periphery. Owing to the transplantation, islands of cicatrisation, from the periphery of which a border of epithelium is developed, are furnished in the area of the wound, by which the cicatrisation of the whole wound is gradually accomplished.

The way in which this interesting process is brought about

can only be shown in part.* It is certain that the transplanted bit of corium immediately becomes united to the granulations of the surface of the wound. This is most easily shown when larger pieces, several lines in length, are transplanted, for they are found to be quite firmly united to the granulations, over a greater or less extent, at the end of a few days. Whether, however, the old epithelium becomes only partially macerated, and from the elements which remain new ones are developed (see Anatomy, in the present chapter), or whether the whole of the old disappears and a new layer of epithelium arises out of the connective tissue and vascular portions of the transplanted corium and of the granulations, cannot as yet be ascertained.

When an excessive formation of granulations occurs, we must invariably strive to destroy them. We attain this end by means of any of the remedies which have been already indicated as appropriate for the purpose of destroying defective (torpid, hæmorrhagic, dropsical) granulations in general. We must particularly note that, in most cases, the physician is able to restrain exuberant cicatrisation, if he does not neglect to destroy the granulations persistently, as soon as, and as often as they project beyond the level of the surrounding parts, by touching them with solid nitrate of silver, or with a concentrated solution of the nitrate. Among the numerous scars which we have the opportunity of observing every year, after burns and cauterisation in patients affected with lupus, epithelioma, and syphilis, we have almost invariably been fortunate enough to obtain slightly, flat, thin, and supple scars by dint of care, and following out the plan indicated. In reference to the methodical application of nitrate of silver in the solid form, or in concentrated solutions, to granulations which are inclined to become hypertrophied, it must be borne in mind that this is not only necessary and advantageous in order to procure a smooth, soft, and supple scar, but that in this plan we also possess a means, which cannot be sufficiently commended, of preventing the union of two opposed granulating folds of skin. This is especially necessary after burns and scalds, and cauterisation with sulphuric acid, &c., of certain portions of skin. Such, for instance, as the folds of skin between the fingers and toes, the fold between the inferior sur-

* See the investigations of Luigi Amabili and Alex. Jacenko on this subject. Cited p. 308.

face of the penis and the scrotum, the palpebral fissure, and the fold between the external ear and the skin of the submaxillary furrow. In all these situations a luxuriant formation of granulations occurs after any deeply penetrating destruction of parts, as the result of which, the folds of skin mentioned, and opposed cutaneous surfaces, may become united to one another. This leads to union of the fingers, of the palpebral fissure from the outer angle inwards, &c., whereby the respective organs suffer a disturbance of function, which is not only disfiguring, and a source of discomfort to the patient, but, by interfering with his ability to follow his employment, may become a matter of vital importance to him. In these cases we apply nitrate of silver to the granulating surface of the wound as often—under certain circumstances even daily—as the granulations project beyond the level of the surrounding parts, even though only to an inconsiderable extent, and each time to such a degree as either directly to destroy the granulations down to the level desired, or to reduce them to this by causing them to shrivel. The cicatrisation of the folds of skin mentioned advances satisfactorily under this mode of treatment, and, if it is once complete, any danger, as is well known, of the union of opposed surfaces is removed.

In the same way we endeavour to obtain thin, supple, smooth, and soft scars by this mode of treatment, in places where thick, roll-like, rigid, and considerably retracted scars have caused very troublesome and permanent changes, for instance, on the neck, where wry-neck has followed burns, owing to the thick scars which have resulted; or over the bends of the joints, when permanent flexion has resulted from such scars, and so forth.

The treatment by compression, by means of bandages and plaster, is occasionally very efficient in causing shrinking of the luxuriant, and consolidation of the loose, dropsical, and hæmorrhagic granulations. This can be varied according to circumstances, since it may either be employed for its own sake alone, and, therefore, associated with mild applications, or in combination with other medicinal remedies which exercise a direct influence on the wound. In carrying out the former plan, mild plasters, such, for instance, as soap-plaster, litharge plaster (common diachylon plaster), &c., are laid directly on the

wound in such a direction, and in such a manner, as to exercise sufficient pressure; or the wound is, first of all, covered with charpie which has been soaked in water or other indifferent fluid, or with dry charpie, or with mild salves and plaster, and then pressure is employed over these, by means of strapping or a bandage. In the second plan, we select a plaster which itself exercises a decided influence with which to employ pressure, and, therefore, according to circumstances, stimulating or cauterising plaster (Emp. Diachyli Co.,* Emp. de Vigo,† Emp. Diabotani,‡ Emp. Oxyrocei,§ &c.), or the compressive dressing is combined with the employment of stimulating or cauterising salves and plasters as indicated, acting directly on the surface of the wound. It must also be mentioned that plasters act to some extent, which should not be underrated, by excluding atmospheric air from the wound, and, owing to the continual fomentation of the latter, prevent the drying up of the secretion from the wound, that is, the formation of crusts, which is so detrimental to the healing of the wound. Pus, however, is confined beneath them, and by this means fresh inflammation and destruction of the granulations, in short, increase of the size of the wound, and retardation of cicatrisation result.

By careful supervision of the granulating process in the sense indicated, and in the directions pointed out, and by the skilful selection of appropriate remedies, it is possible, as a rule, to keep the granulations within the normal range as to development and progress, and to obtain sightly scars.

Not infrequently, we are called upon to diminish or remove the deformities and limitations of function, caused either by scars which are in other respects normal, or, what is more common, however, by hypertrophied, roll-like, firm, tense, prominent scars, such as often remain after cauterisation (sulphuric acid), burns, extirpations, &c. This is not to be accomplished by any means easily, and failure results so often, that an experienced physician will prudently avoid raising the expectations of the patient too high, and will even prepare him for eventual want of success. Sometimes we can undoubtedly effect material improvement in the appearance and condition of the scars by means of appropriate treatment.

* Resin plaster. † Mercurial plaster. ‡ Composed of many herbs. § Saffron and vinegar plaster.—Tr.

However urgently patients, as a rule, may desire operative interference for the removal of tumour-like scars, it is but rarely that it is well to accede to their wish. In the first place, it may be stated beforehand, with certainty, that after the excision of any scar a proportionately larger, more extensive one will necessarily be developed, inasmuch as a greater loss of substance will be caused, in proportion to the size of the original scar itself. In many cases, however, an increase in the area of the scar is a still greater misfortune than its tumour-like condition. The latter cannot, however, be avoided in all cases, nor, indeed, in any case with absolute certainty. In the first place, as has been already stated, many scars hypertrophy subsequently, that is, after cicatrisation has long been completed. And, further, as was explained in the preceding chapter, it is impossible to decide from the clinical appearance whether what appears to be a hypertrophied scar is not, probably, a cicatricial keloid. The latter, it would appear, always returns. In this way, therefore, it is but seldom that the cure, and still more rarely that the satisfaction, of the patient is to be obtained. In some cases, the excision of an ugly, hypertrophied scar, with a subsequent or simultaneous plastic operation, will be attended with a successful result.

On the other hand, some defects in scars may be obviated by the persevering use of less energetic remedies and methods of procedure. Baths, employed for several hours, daily, for a long period, cause scars to assume a softer and more supple character after a time. It is immaterial whether artificially heated or naturally warm baths (simple or sulphurous hot springs) be employed. The length of time during which the baths are used daily, and the number of them altogether, are of importance. Moreover, scars become less tense if slight inflammatory processes are set up in them from time to time. It would seem as if the cells which exist in such large quantities in the young cicatricial tissue, and also, in part, the young connective tissue contained in it, were in this way predisposed to undergo disintegration, and also, perhaps, new vascular and lymphatic paths become opened up, temporarily, by which their absorption would be facilitated, in the same way in which other morbid, young granulation formations (young lupoid tubercles or syphilitic papules) may be disintegrated and absorbed.

Such reactionary processes as are here indicated are set up by the employment of glycerine of iodine, of mercurial plaster, mild cauterisation with solution of nitrate of silver, and the like. We commonly paint glycerine of iodine on the affected parts for this purpose. A solution of iodine and iodide of potassium, of each one drachm, in two drachms of glycerine, is rubbed thoroughly, by means of a stiff painter's brush, on the cicatrix, and this is then covered with gutta-percha paper. A burning sensation, lasting for two or three hours, is the common result of the application. If the pain be very severe, the gutta-percha paper may be removed after this period has elapsed. The process should be repeated twice a day for three or six days, that is, from six to twelve times altogether, and should be discontinued as soon as the cicatrix and the part adjacent to it become reddened, swollen, hot, and painful. After some days, the brown crust which is formed becomes detached, and the scar then has a glistening, pinkish aspect, but is smooth and soft. The thin, parchment-like epidermis still desquamates for some days, until a uniformly adherent, thicker, and white epidermic layer has been properly formed. By frequent repetition of the series of paintings with iodine, described, that is, in consequence of the inflammation set up now and again in this way in the scar, the latter at last becomes softer, and, owing to obliteration of many of its vessels, white. The application of mercurial plaster, cauterisation with solution of nitrate of silver, methodical painting with sulphur-pastes, &c., act in a similar manner.

This plan, however, will not level considerably elevated cicatricial tumours. In such cases, it is better to remove the tumour with the scissors, or with a knife held flat. The freely bleeding surface of the wound is immediately touched with nitrate of silver, and the latter is also applied during the process of healing as often as the granulations project beyond the surrounding level. As a rule, a flat scar will result.

A few varicose vessels, taking a spiral course, occur occasionally, even on quite pallid scars. They attract more attention, owing to their being situated on a white ground. They may be destroyed by making fine, longitudinal incisions into them, and touching the bleeding spots with nitrate of silver, or with

charpie dipped in a dilute solution of chloride of iron. The vessels then become obliterated.

In spite of the good effect which the methods of procedure mentioned, and the like, exercise on the annoying peculiarities and defective condition of some scars, we must not expect too much from them, and, especially, we must not think that they will remove the necessity for the exercise of patience on the part of the physician and patients. Time, also, acts as an element in the cure. In the course of months and years most scars lose much of their rigidity and redness.

The neuralgic affections which were previously mentioned as occurring in connexion with scars, are occasionally alleviated, or wholly removed by the external application or internal administration of opium. Thus, for instance, by morphia injected subcutaneously, Emp. de Meliloto, Emp. saponat, Emp. Cicutæ, &c., with or without the addition of powdered opium, extract of opium, or belladonna, hyoscyamus, &c. Also by the internal use of opiates, narcotics in general, chloral hydrate, &c. Occasionally, however, every kind of remedy, which is supposed to be of any avail, may be tried in various ways quite fruitlessly. Thus we may see irritation of the skin set up in all sorts of ways, by means of collodion, tincture of iodine, glycerine of iodine, vesication confined to the same place, or in the form of flying blisters, and the ethereal oils, without any beneficial effect, and, at best, attended with a fresh, painful inflammation of the skin. The use of baths, hot springs of all sorts, or the hydropathic treatment, all fail to give the patient any relief as a rule. Just as ineffectual is the employment of electricity, and it is only in a few cases that this gives any relief. The internal administration of arsenic (Fowler's solution), strychnine, aconitine, &c., is prescribed rather to fulfil the moral necessity of attempting to do something than from any evidence of their usefulness afforded by experience. Nevertheless, we have seen remarkably good results follow the internal use of Fowler's solution in increasing doses. If these neuralgic symptoms have continued for a long time, in a severe form, and the remedies at our command are of no avail, we are, obviously, necessarily compelled to adopt a more experimental proceeding than that dictated by empiricism. The excision of the painful scars, or

even of scars which are not painful, but which are supposed to be the exciting cause of pain, or, further, excision of the affected nerve-trunks, when only isolated and non-essential ones are involved, suffices to remove for a long time, or even permanently, the painful malady. Finally, it must not be overlooked that, occasionally, after the lapse of months, or of years, the neuralgic affections named may spontaneously become less severe, or may recur less frequently, or may even wholly subside. Not unfrequently, therefore, we may be induced, under such circumstances, to attribute results to the method of treatment adopted, which should really be ascribed to the influence of time, and to the anatomical changes taking place in the structures affected.

CHAPTER XLIX.

MOLLUSCUM FIBROSUM.

MOLLUSCUM pendulum, Molluscum simplex, Molluscum non-contagiosum (Willan and Bateman); Ecphyma mollusciforme, Molluscum areolo-fibrosum (Wilson); Fibroma molluscum (Virchow); Molluscum albuminosum (Thomson).

History.

Ludwig and Tilesius contributed the first account of this affection which was of any real value. In a monograph, entitled 'Historia pathologica singularis cutis turpitudinis Jo. Godofredi Rheinhardi (de Mühlberg) viri L. annorum, præfatus est Dr. Chr. Fridericus Ludwig, Leipzig, 1793' (Deutsch und Lat.), we find a description (in the text) and representations (in three plates) by Tilesius of the man Rheinhard mentioned in the title. His body was studded with numerous small and larger tumours and appendices, which were of the same colour as the skin, or reddened and dry, or here and there gave exit to discharge. At page vi of the preface, from the pen of Ludwig, it is said respecting these tumours: "Verum enim Reinhardi visu foedem corpus teetum est verrucis *mollibus* sive *molluscis* et madidis sive *myrmeciis*."

Now, though Ludwig compared these tumours to verrucæ myrmeciæ, described by Galen as soft, fleshy, glandular, moist warts, it is quite evident, both from Ludwig's description and the characteristic representation given by Tilesius, but especially from the illustration given by the latter, that we must not understand these "verrucæ myrmeciæ" to mean common warts, but a peculiar form of tumour, not so described till the time of Ludwig. There cannot, however, be any doubt that Plenck*

* 'Doctr. de morb. cutan.,' Viennæ, 1783, p. 97.

has described warty moles under the term *Verruca carnea seu mollusca*.

Bateman was the first to attach a more independent meaning to the term Molluscum. He applies it to two kinds of formations. First of all to the cutaneous tumours described by Tilesius, which he figures in plate lx., fig. 1, of his Atlas, and calls Molluscum pendulum,* and, in the second place, to a wart-like structure, represented in plate lxi., and which he names Molluscum contagiosum.†

Willan was only acquainted with the first form, and the drawing was procured by him ("from a case which occurred under his own observation"), whilst Bateman had not seen the case. On the other hand, Willan was unacquainted with the second form, which was only seen by Bateman himself later. ("This singular eruption has not been noticed by Dr. Willan, and was unknown by myself till after the publication of two editions of my synopsis.") Manifestly, therefore, it is the latter who considered the two maladies related to one another, and hence applied the name Molluscum to the second.

Bateman undoubtedly calls attention to the fact that the form named by him Molluscum contagiosum differs from the Molluscum pendulum of Willan in two respects, 1st, in its being contagious, and, 2nd, in the presence of a milky fluid, which may be pressed out through a scarcely perceptible opening existing at the summit of most of the largest tubercles. Nevertheless, by applying a common designation to the two maladies differing so essentially from one another, Bateman chiefly contributed to the confusion which subsequently prevailed among authors, and, the more so, as Bateman himself afterwards confounded the two forms directly with each other, or did not distinguish sufficiently strictly between the two,‡ since he commonly treated of both of them under the simple designation of Molluscum.

The observations of Carswell and of Thomson,§ which were published in the course of the next few years, and the

* 'Delineations of Cutaneous Diseases,' London, 1817.

† In the text to plate lx., Molluscum pendulum is referred to as shown in fig. 3, whilst it appears as fig. 1 in the plate.

‡ See 'Prakt. Darstellung der Hautkr. nach Willan's System, v. Thom. Bateman.' Deutsch. von Abr. Hanemann. Halle, 1815, p. 395 und idem, Deutsch von Blasius, Leipzig, 1841, p. 358.

§ Hale Thomson (Molluscum albuminosum), 'Lancet,' vol. ii., 1841.

dermatological treatises of Bielt, Cazenave, and Schedel, show undoubtedly that sometimes one and sometimes the other form of the molluscum of Bateman was noticed, without, however, any very minute examination of them having been made. Moreover, Alibert's* delineation of molluscous tumours on the face, which he designated as *Mycosis fungoides*, and the fact that Rayer adopted the term *Molluscous* for a cancerous growth, whilst he, at the same time, made use of a descriptive phrase (*Elevures folliculeuses*) to designate a formation resembling *Molluscum contagiosum*, only increased the uncertainty which existed as to the distinction between Bateman's forms of molluscum.

On this account, the work of Jacobowics,† which appeared in the year 1840, will always be worthy of notice, in spite of its slight intrinsic value in other respects, because this subject was again treated in it, and the distinction between the different forms of molluscum was pointed out. Jacobowics, however, was not satisfied with making two forms of molluscum, as Bateman had been, originally, namely, 1, *Tubercula fungosa*, *molluscum fungosum*, which corresponded to the form mentioned by Ludwig, and to the *Molluscum pendulum* of Willan and Bateman; 2, *Tubercula atheromatosa*, equivalent to the *Molluscum atheromatosum s. contagiosum* of Bateman; but he added another form, 3, *Tubercula variegata*, or *Tubercules bigarrés*. The latter, however, judging from the representations given (plate ii.), was applied by Jacobowics to structures already known under other names, such as *Milium*, and various warts, and, therefore, does not require any further notice. The error, which originated with Bateman, of grouping two formations which were essentially different from one another under one designation is, therefore, corrected by Jacobowics in one respect, but in another respect, that of unwarrantably adding a third kind of so-called molluscum, he only increased it. Moreover, as this publication, otherwise of an insignificant character, was in the form of a monograph, it served constantly as a foundation for the indecision of many subsequent writers, who, like Behrend,‡ previously, and

* Atlas, planche 36.

† 'Du Molluscum, recherches critiques,' Paris, 1840 (with four coloured plates).

‡ 'Ikonographische Darstellung der Hautkrankheiten,' Leipzig, 1839, p. 64, Taf. xix., und p. 82, Taf. xxviii.

Simon,* later, and others, partly included, under molluscum, degenerations of the sebaceous glands and their ducts, atheromata, sebum-warts, partly certain forms of warts and moles, as *nævus mollusciformis*, *verruca carnososa*, *acrochordon*, *acrothymion*, *nævus lipomatodes*, &c., or at least believed them to be allied affections, or increased the difficulty of becoming acquainted with the malady in question by creating a new name, like Hale Thomson (*Molluscum albuminosum*, 'Lancet,' vol. ii., 1841).

Even if we disregard the cases represented by Carswell and Thomson,† Henderson, Paterson, and others, which are more or less recognisable as *Molluscum contagiosum*, and, also, the communications of Bielt, Cazenave, and Schedel,‡ which evince their inexperience in this matter, yet we cannot avoid mentioning, as proof of the confusion which reigned later as regards molluscum, that, like Alibert and Rayer had done previously, Dr. Turnbull§ regarded a probably cancerous growth as molluscum; that, further, Er. Wilson, even, at one time, indicated *Molluscum contagiosum*,|| and, some years later, *Molluscum fibrosum*¶ as *Molluscum simplex*; and, also, that Prof. Engel's case of "molluscum"*** of the nose should be considered as *acne rosacea* rather than molluscum, in our meaning of the term.

Rokitansky,†† at the same time that he determined the histological conditions met with in *Molluscum simplex*, avoided the custom then prevalent, and partly existing at the present time, and did not notice in his account any of the formations usually confused with molluscum.

The critical account which Virchow‡‡ gave of molluscum, though not entering into all details, at any rate facilitated the strict separation of *Molluscum fibrosum* from the other forma-

* 'Die Hautkrankheiten,' Berlin, 1851, p. 233, und Taf. v., figs. 2 u. 3.

† 'Edinb. Med. and Surg. Journ.,' vol. lvi., p. 463.

‡ 'Abrégé pratique des mal. de la peau,' Paris, 1847, p. 436.

§ 'Edinb. Med. and Surg. Journ.,' vol. lvi., p. 463.

|| 'Portraits of Diseases of the Skin,' 1855, plate 38.

¶ 'Diseases of the Skin,' 1867, 6th edit., pp. 782 and 369.

*** 'Untersuchungen eines Falles von Molluscum,' Wiener med. Wochenschrift, 1865, No. 82. Engel found enlarged glands and cysts developing from these in the pouch-like, pendulous, nasal folds of skin.

†† Path. Anatomie, 1856, 2 B., p. 68.

‡‡ Archiv, B. 33, p. 144, und 'Geschwülste, 1 B., Titelbild und Text, p. 326. Berlin, 1863.

tions usually indicated by similar designations. This is all the more noteworthy because Förster, in the year 1858, whilst giving a very valuable account of the histology of the molluscous formations, had adopted a very artificial system of classification, based solely on the anatomical conditions found, and completely ignoring the clinical features.*

Hebra strictly maintains the distinction between the different forms in his 'Atlas of Skin Diseases,'† both in the text and in the drawings.

Symptoms.

Molluscum fibrosum occurs in the form of sessile or pedunculated tumours covered with normal skin, for the most part well defined, and of the same consistency throughout, sometimes as soft as dough, sometimes firmer. They vary much in size and shape. Some are represented by a barely perceptible elevation of the skin, or are of the size of a pea or bean, and, being situated almost entirely in or under the corium, in the subcutaneous cellular tissue, may only be distinctly recognised with the aid of the finger. Others consist of sessile tumours of the size of a nut or of the fist. Others, again, have grown into tumours of the size of a child's head or larger, which have pushed the skin before them, are elevated entirely above the level of the surrounding parts, and form pedunculated, pear-, club-, dewlap-,

* Wien. med. Wochenschr., 1858, Nos. 8 u. 9, 'Ueber die weichen Warzen und molluskenartigen Geschwülste der Haut.' At the end of his description, Förster gives the following scheme for the classification of the molluscous tumours:—

I. HYPERTROPHY.

1. Tumours consisting of folds of skin (skin only).

- (a) 2. Soft warts.
- (b) 3. Cellular-tissue polypi.

II. NEW GROWTH.

A. Diffuse.

- (4) Areolar connective tissue.
- (5) Compact connective tissue.

B. Circumscribed.

- (6) Fibroma } Fibroid.
- (7) Myoma }
- (8) Sarcoma.
- (9) Lipoma.

† Lief. vii., Taf. 11,

or purse-shaped appendages. This is the condition in which we meet with the largest and heaviest of these tumours, which may weigh many pounds,* and a number of them may be scattered over whole regions of the body. The skin over the smaller tumours is, as a rule, of normal colour and condition; over the larger ones of a uniform character, or, over the most projecting part of the tumour, thinned, glistening, and, owing to distended blood-vessels, of a pinkish or bluish-red tint or marbled, and, where dependent, of a cyanotic aspect. The hair follicles and the sebaceous glands in the cutaneous covering of the molluscum are in a normal condition, or, particularly over the larger tumours, somewhat altered. The hairs, namely, have been in great part shed from their follicles. The apertures of the sebaceous follicles, on the contrary, are mostly enlarged and filled with plugs of sebum, which may be squeezed out in the form of thick comedones. The molluscum, however, possesses no duct nor any canal in its interior. In the skin covering many of the tumours, especially the larger ones on the scalp, the hairs are entirely wanting, the hair follicles are destroyed, and the skin has a smooth, glistening, atrophied appearance.

The tumours of molluscum vary much in consistence. Some of them, especially the smaller ones, have a uniform, doughy feel, others, especially the larger ones, are somewhat firmer, and the largest are at different parts of varying consistence, often being, at the same time, lobulated, some of the lobules having a soft, jelly-like feel, and others being firmer, and communicating a greater sense of resistance to the touch. Some of the smaller tumours are so soft that they may be squeezed flat between the fingers, and seem like empty, pouch-like protrusions of the skin. On careful examination, however, it will be found that between the apparently empty folds of skin, there is a mass of tissue included which may be followed by the fingers deeply towards the subcutaneous tissue, for it increases in size as it is continued in this direction.

The molluscous tumours occasionally occur singly, one or a few only being present, and are then generally situated on the back. Not infrequently, however, we meet with them in great abundance, hundreds becoming developed on the body. These

* In the case quoted by Virchow (*loc. cit.*), a molluscum removed by Dr. Heyland weighed $32\frac{1}{2}$ pounds.

are the most remarkable and instructive cases, for they afford the opportunity of seeing molluscum in the most varied stages of development, forms, and sizes in the same individual. Such cases of universally distributed molluscum have afforded the material for Ludwig and Tilesius' publication, as well as for many subsequent accounts* of this disease. Both the single and multiple molluscous tumours are most frequently met with on the upper half of the body, on the trunk, and the head. They often occur as pendulous tumours on the forehead, side of the head, and cheeks, in great numbers and variety of form and size, occasionally overlapping one another, and may hang down over the eyes so as to close them partially or wholly; or may be situated on the side of the neck as thick or flattened, purse-shaped, dewlap-like cutaneous tumours, in which form of mane-like appendages they remind us more of the *facies leontina* of the ancients (Virchow) than do the thick but not large tumours which cover the eyebrows in Leprosy, for which, formerly, that designation had been used. Large specimens of these tumours also occur on the upper extremities, on the greater and lesser labia, on the scrotum, and, less frequently, on the lower extremities.

In rare cases, molluscous tumours may be observed on the mucous membrane of the cheeks, and of the hard and soft palates growing from the sub-mucous tissue.

Development and Course.

No practitioner has hitherto been able to observe the development and course of molluscum continuously during any lengthened period, and for the simple reason that, owing to the incurability of the disease, the patients remain but a short time under the care of the same physician. Much, however, may be determined with probability as to the development and course of molluscum from a comparison of the many nodules and

* See Virchow *Geschw.*, i. B., Titelbild; Pick, 'med. Wochenschr. Jhrg.', 1865, 49; Izett Anderson, 'Journal of Cutaneous Medicine,' 1867, 1 vol., p. 69, with illustration; Wilson, *ibid.*, 1869, vol. iii.; Hebra, *Atlas*, Lief. vii., Taf. ii.; and others.

Pl. xviii., New Syd. Soc. *Atlas*, represents the portrait of a man, aged 27 (under the care of Mr. Hutchinson), covered with these tumours. See also Catalogue to *Atlas*, p. 58.—Tr.

tumours which are present at the same time on the same individual, and which differ widely amongst themselves in size, shape, colour, consistence, &c., whilst, on the other hand, their peculiarities show many signs of similarity and of transition. The anatomical conditions met with in molluscum, which will be described later, afford essential help in this respect.

The greater number of the tumours develop during the earliest period of childhood, but it is probable that fresh ones also make their appearance later. It must not be forgotten, however, that it is possible that the latter may have been present in an undeveloped condition in childhood, and have merely become evident later in life owing to an increase in their size taking place.

The molluscous tumours consist originally of nodules which are not visible to the eye, but can be felt by the finger, are of the size of a pea or bean, moderately firm, immovable, and situated beneath the skin (in the subcutaneous cellular tissue). Occasionally the situation of the tumours may be recognised by a bluish-red discoloration of the skin over them, which, however, is not at all raised. In proportion as the nodules increase in size, they approach the surface and push the skin before them. Finally, they form tumours, as described above, of various sizes and shapes; some of them remain stationary at an early stage, whilst others continue to grow till they weigh many pounds, and form tumours of corresponding dimensions. Further, differences in development depend on the histological structure of the connective tissue composing the tumours; for this at one time—especially in the smaller tumours—remains in the condition of immature, jelly-like tissue, and, at another time—chiefly in the older and larger tumours—becomes converted into filamentous and fibrous tissue (see Anatomy).

It would appear also that the molluscous tumours are capable of undergoing involution to a certain extent, and in a certain sense. This, of course, applies only to those which are merely composed of young connective tissue. The mass of tissue enclosed by the purse-shaped, prominent folds of skin may shrink, for instance, to such an extent that the bag of skin appears to be an almost empty cutaneous appendage. If this is rolled between the fingers, it scarcely seems as if there were any solid substance to be felt, whilst, with the aid of the fingers, we

can detect a rather firm nodule in the base of the cutaneous appendage, that is, in the subcutaneous tissue; a circumstance which is not without importance in forming a judgment as to the situation from which the tumours originally spring.*

The further changes which a molluscum may undergo are of a mechanical origin, rather than due to any nosological or histological conditions. In the first place, the cutaneous covering of a molluscous tumour, owing to excessive stretching, may undergo changes similar to those which always result when the skin is stretched over a tumour. It appears red, glossy, marbled, its epidermis desquamates, or it is excoriated and weeping. Finally, it may become gangrenous at the highest part of the tumour, and an ulcer may form. Moreover, if the tumour, owing to its own weight, exercises such a traction on the blood-vessels contained in its neck, that the circulation in the tumour is impeded or arrested, the whole of it may become gangrenous, and drop off spontaneously. Similar changes may be caused by mechanical pressure from the clothes, bandages, burdens, by friction, blows, &c. As has been mentioned, all these changes are directly due to the mechanical influences brought to bear on the tumours.

When not subjected to any of the influences mentioned, the molluscous tumours, having arrived at a certain stage of their development (size), persist without any noticeable changes during the remainder of the patient's lifetime.

Subjective Symptoms.

The tumours themselves do not cause any painful or unpleasant local sensations, either at the time of their commencement,

* Förster is of opinion (loc. cit.) that no central mass exists in the cutaneous fold in question (Hautfalten-Geschwülsten, as he calls them), yet he states that "a thin layer of fatty tissue" is met with as a connecting substance, and that the fold can only be separated when this has been divided. That the bulk of a molluscous tumour (according to Rokitsansky and Virchow) is very often developed from the connective-tissue network of the lobules of fat, is rendered probable by the fact of the latter remaining behind in the situation of the growth of connective tissue after this has again disappeared, owing to atrophy. We must, therefore, from this point of view, consider Förster's "fatty tissue uniting the folds of skin" as the remains of the solid portion of the molluscum, and the tumour made up of a fold of skin, as a shrunken molluscum.

or during their further development, or in their stationary condition; nor do they appear to exercise any injurious influence whatever on the general condition of the individuals affected. They are, nevertheless, exceedingly troublesome and disfiguring, from their great number, the material weight of the single tumours, the inflammatory processes previously described, which occasionally attack them, and, lastly, from the mechanical impediments to the action of many joints and organs caused by some of the tumours, owing to the situation in which they occur. Thus they interfere with walking, with the use of the arms and legs, not only on account of their occasional heaviness, but on account of their being situated over the bends of the joints, or on the nymphæ; they interfere with the lateral movements of the head, owing to their being interposed between the jaw and the thorax, and they prevent the free use of one, or of both eyes, by drawing the upper eyelid down over the eye, like a curtain, so as to close it completely, and the patient is obliged to raise the lid by lifting up the tumour before he can see, and so forth.

Anatomy.

The essential anatomical conditions met with in *Molluscum fibrosum* (s. simplex) have been fully stated by Rokitansky* and Wedl.† The later investigations of Virchow‡ have, in some degree, supplemented their accounts. Krämer§ and Simon|| have only slightly mentioned the subject. More modern authorities, and those who have written most recently—Wilson,¶ Pick,** O. Weber,†† Billroth,‡‡ Neumann§§—have confirmed the statements of the above-named anatomists. Förster,||

* 'Pathol. Anatomie,' 2 B., p. 69.

† 'Grundzüge der pathol. Histologie,' 1854, p. 469.

‡ Geschw., 1 B., p. 326.

§ 'Ueber Condylome und Warzen,' Göttingen, 1837, s. 59.

|| 'Hautkrankheiten,' p. 235.

¶ 'On diseases of the Skin,' &c. London, 6th edition, p. 369.

** Loc. cit.

†† 'Handbuch. allg. u. spec. Chirurgie herausg.,' v. Pitha-Billroth, Erlangen, 1865, ii. B., 2 Abth., p. 41.

‡‡ 'Vorles. über Geschwülste,' Berlin, 1868, p. 27.

§§ 'Hautkrank.,' p. 337.

||| 'Wiener med. Wochenschr.,' 1858, No. 8, u. 9.

however, has proposed a classification (given in detail at p. 329) of all molluscoid growths, based on a comparison of their anatomical structure, and has divided the kind we are now considering into several varieties (i., 1, and ii. B., 6, of his classification), whilst Fagge* differs from other authors in restricting the starting-point of molluscum to the connective tissue around the hair follicles.

Rokitansky says (loc. cit.) the tumours of *Molluscum simplex* "consist of a protrusion of the corium, which is pushed forwards by an accumulation of young, gelatinous, connective tissue, in one of its deeper meshes. This new growth increases in size, and develops into a mass of fibrous texture, which is separated from the surrounding tissue, and may, as it were, be shelled out from the bag of skin in the form of a fibrous tumour. The hair follicles and the sebaceous glands have been already included in the tumour." Rokitansky's account has this great advantage, that in its essential points it is applicable to all molluscous tumours. For these always consist of connective tissue. The anatomical conditions found, however, differ essentially according as to whether the tumour investigated is a small or a large one, or is in an early or advanced stage of development, and, finally, even in different parts of the same tumour. These differences concern the topographical relation of the tumour to its cutaneous envelope, as well as its histological character. If, for example, a section is made through the long axis of a small, pear-shaped molluscum, dividing it into two halves longitudinally, the substance of the tumour appears as a white, or yellowish-white, irregularly fibrous mass, which is denser towards the base (stalk), more loosely arranged towards the periphery (free extremity), in the centre is of a somewhat gelatinous character, may be easily moulded between the fingers, and gives exit to a small quantity of a yellowish-white fluid on pressure. Even with the naked eye, we can recognise broader, coarser, irregularly arranged fibrous bands at the base of the tumour, whilst the spaces enclosed by them are filled with a finer, more delicately fibrous material. Towards the free extremity of the tumour, its tissue becomes more delicate, and more loosely arranged, and its fine, more

* 'On the Anatomy of a Case of *Molluscum Fibrosum*.' By C. Hilton Fagge. 'Med. Chir. Trans.,' vol. liii., Lond.

widely separated fibres become continuous with the dense felt of the corium. No sharp line of demarcation exists between the latter and the substance of the tumour, neither can this be simply shelled out of its cutaneous investment. In the sessile tumours, which are less completely invested by skin, the denser and coarser fibrous bands are likewise more abundant at the base. The difference mentioned in the direction and size of the fibres is also evident, under the microscope, in thin sections, and in teased-out preparations. Here and there, especially in the peripheral parts, there are cells with large, highly refractive nuclei, which almost completely fill the cell-cavity, and become beautifully stained with carmine, whilst, in other parts, such are only met with in small numbers, and widely separated. In other tumours, which are larger, or, at least, older, the dense, coarse, firm, fibrous network reaches nearly to the surface, is everywhere more abundant, and, therefore, encloses smaller spaces, filled with a finely fibrillated connective tissue. From the most peripheral spaces, thin, finely fibrillated and widely separated bundles pass into the tissue of the corium. For this reason, such tumours appear to have a more fibrous texture (Rokitansky), to be more sharply defined from their cutaneous covering, and capable of being more easily enucleated, because all that requires to be torn through is the loose fibrous network which connects the tumour with the corium. At the base, however, the mass of the molluscum can never be enucleated, for here it is connected intimately, even in the pedunculated tumours, by a broader base, with the deeper connective-tissue layers of the corium (Rokitansky), or with the connective-tissue septa between the fat-lobules (Virchow), so that even in the pedunculated tumours, the tissue of the pedicle extends into the deeper layers of the subcutaneous connective tissue.

Injected preparations in our possession show that vessels exist in greater numbers, and of larger calibre in the base of the molluscum than at the periphery. The meshwork formed by them is irregular. The pedicle of the pedunculated tumours contains one or several vascular trunks, which are, for the most part, venous.

The glandular organs—the sweat and sebaceous glands—are unaltered in some parts of the tumour, or, in many tumours, are everywhere intact, the former being the condition most

frequently met with; often, however, especially in parts and in tumours which have existed for a long time, and are of firm, fibrous texture, they are either few in number or altogether absent. The same applies to the hair follicles, and the sheaths of the hairs and of their roots. Occasionally they are quite intact. In the larger and older tumours, however, the hair follicles and the glands are separated by the fibrous bands of the molluscum, and the root-sheaths hornified. At last, we only find rudiments of hair follicles with epidermic contents. The follicles become atrophied, and for this reason we often find the skin over a molluscum on the scalp quite bald.

In its internal structure, therefore, *Molluscum fibrosum* resembles the tissue of *Elephantiasis Arabum mollis*,* which, as Kraemer and Virchow have shown, likewise consists of young, gelatinous connective tissue; and there is also sometimes an unmistakeable resemblance between the two in external appearance. This applies, for instance, to the pendulous tumours of the female genitals, which are known as *Elephantiasis Arabum*, and which are exactly similar to molluscum. In our opinion, however, the tissue of *Elephantiasis Arabum* contains a greater quantity of cells, which are also more uniformly arranged, is much more succulent, and, especially here and there, has a much coarser network, the spaces of which sometimes form large cavities containing a fluid (lymph) rich in cells. Such do not occur in the tissue of the molluscous tumours; it is much poorer in cells, and much more frequently and completely resembles the firm, fibrous structures.

There is much greater resemblance between molluscum and certain congenital warty moles, which are of the normal colour of the skin or deeply pigmented, smooth or tuberculated on the surface, covered with lanugo or thick, bristly hairs, occur singly or often in large numbers, and of various sizes, form sessile or pedunculated, purse-shaped appendages of the skin, and have been described as *acrochordon*, *acrothymion*, *myrmecia*, and *nævus spilus*, and of which the pedunculated ones with a smooth surface appear to us to be best designated by the term *Nævus mollusciformis*. The hypertrophy of the corium and of its

* Pick's placing *Molluscum Simplex* in juxtaposition with *Lepra tuberculosa* ('Med. Wochenschn.,' loc. cit.) is probably due to a slip of the pen.

papillæ, and the accumulations of pigment often met with in the cells of the rete in these warty structures, however, form a striking contrast to the molluscous tumours which they resemble. In molluscum, the tissue of the corium and the papillary layer are quite unaltered, not in the least hypertrophied; and, moreover, in *Molluscum fibrosum*, the hypertrophy of the subcutaneous connective tissue undoubtedly predominates.

For the most part, the molluscous tumours develop from the connective tissue of the deeper layers of the corium (Rokitansky), and probably from the connective-tissue framework of the subcutaneous fat-lobules (Virchow, loc. cit., p. 326, fig. 57). This view is supported by the depth at which the smallest molluscous tubercles are situated, by the broad and firmly fixed, deep extension even of the pedunculated tumours, by their having a more fibrous texture at this part, which is, therefore, their oldest part, and, lastly, by the circumstance that in shrunken tumours we find the connective-tissue framework of the fat-lobules left behind as the remains of the nucleus of the tumour (Förster's *Hautfaltengeschwülste*, see p. 333). Some tumours, however, are met with between the layers of the corium itself (Virchow, loc. cit., fig. 58). On the other hand, Fagge and Howse have endeavoured to show that the molluscous tumours develop around hair follicles, and, indeed, from the connective-tissue framework of these and of the sebaceous glands connected with them, and^a that both these become incorporated with the tumours, so that the latter consist of a central, glandular structure (hair follicles and sebaceous glands), and of a peripheral portion made up of connective tissue. Fagge rightly remarks that this statement must be considered, for the present, as only applicable to the case he has described. That the hair follicles become included in the structure of the tumour, that is, altogether incorporated with it, has been stated by Rokitansky. This does not, however, occur with such regularity that the connective-tissue walls of the hair follicles can be considered to be the constant starting-point of molluscum, and the less so because, as has been previously shown, molluscous tumours may develop from portions of connective tissue which are deeply situated, and also from the deeper portion of the framework of the corium itself. Fagge, himself, also states that molluscum may develop in parts where neither hair follicles nor sebaceous

glands exist, for instance, in the palm of the hand and the sole of the foot, and in the submucous tissue of the hard palate.

Diagnosis.

When we consider the remarkable shape, number, arrangement, consistence, the doughy softness, or fibrous condition of the molluscous tumours, and bear in mind the fact that they enclose no cavity, and do not possess any ducts, and that, consequently, no fluid can be squeezed out of them, we are led to think that their diagnosis, and especially from *Molluscum contagiosum*, must be very easy, and the more so if a microscopic examination can be made, and their connective-tissue character demonstrated.

Nevertheless, we must not forget that, according to what has been previously mentioned, in spite of the apparently very characteristic peculiarities of *Molluscum fibrosum*, difficulties in the way of diagnosis may be met with under certain circumstances. In the first place, the tumours of *Molluscum contagiosum* may have a similar shape and exist in considerable numbers. They may be only partially filled, and, therefore, have a soft, doughy feel. The duct leading from them is often plugged, or completely destroyed, and then their "milky contents" cannot be squeezed out.

On the other hand, enlarged sebaceous glands, full of plugs of sebum of cheesy softness, which may be squeezed out, thus simulating the contents of the tumours of *Molluscum contagiosum*, may be met with in the skin covering the tumours of *Molluscum fibrosum*. Or, enlarged hair follicles and sebaceous glands may be incorporated in the structure of a *Molluscum fibrosum*, as in the cases of Tilesius (loc. cit., p. 11), Fagge (loc. cit.), and Dr. Beale,* and their contents, as in *Molluscum contagiosum*, may be extruded by pressure. These circumstances seem to explain how it is that Engel has reported a case of molluscum (see p. 328), which was probably one of acne rosacea with hypertrophy and duplicature of skin and enclosure of glandular cystic tumours.

Lastly, it must be noted that *Molluscum fibrosum* may occur in conjunction with *Molluscum sebaceum*. It is in the most

* Trans. Path. Soc., Lond., vol. vi., 1855, p. 313. Cited by Fagge.

typical cases of Fibroma molluscum, in which hundreds and hundreds of fibromatous tumours, of all sizes, are scattered over the body, that affections of the sebaceous glands and their ducts are met with in the most varied forms, such as comedones, acne tubercles, atheroma, and Molluscum sebaceum, especially on the face, the breast, and the back. We cannot find that this occurrence of tumours of Fibroma molluscum, in association with affections of the sebaceous glands, in the form of tubercles and cysts, has been mentioned elsewhere, but to it may be attributed, in great measure, the difference of opinion which has hitherto prevailed in regard to molluscum. It is, consequently, necessary to pay attention to all these points, and, under all circumstances, to bear in mind the peculiar features appertaining to Molluscum fibrosum.

In regard to the mulluscoid, warty formations previously mentioned, it must not be forgotten that, in them, the corium and the papillary layer are hypertrophied, whereas, in molluscum, the corium is unaltered, or is not hypertrophied, but, on the contrary, may appear thinned, that is, atrophied.

Any confusion between molluscum and the affections last named would be still more easily avoided if Pick's opinion were adopted—that only those affections should be called Molluscum in which the tumours appear in great abundance scattered over the body, for molluscum is generally multiple, whilst only a few of the warty formations are met with, for the most part, in the same individual. On the one hand, however, molluscos warts not infrequently occur in very great numbers and great varieties of form in the same individual. Of this we lately saw an instance in a child four months old, in whom there existed, in addition to small molluscos structures, also isolated nævi spili, pigmentosi, and mollusciformes, covering whole regions of the body. And, on the other hand, we not infrequently meet with single tumours which, both from their appearance and histological character, must be regarded as Molluscum fibrosum.

We are most liable, however, and most pardonably so, to confuse the molluscos tumours, and especially the large and pedunculated ones, with the tumours of Elephantiasis Arabum mollis, to which they are most closely related in their essential characters.

Multiple fibromata and lipomata of the skin ought to be

distinguishable from the molluscos tumours, which are, for the most part, of jelly-like softness, on account of their peculiar hardness, and, in the case of the latter, owing to the lobulated structure, and a microscopic examination would reveal marked differences between molluscum and the other two, and also multiple neuromata.

A short time ago we saw a case of universal glandular hypertrophy. All the lymphatic glands of the subcutaneous connective tissue were enlarged so as to form lobulated and painless tumours. The localisation of the tumours to the situations of the normal lymphatic glands furnished us with the means of diagnosis.

Multiple carcinomata and sarcomata may be recognised by their special characteristics, which we will not further consider here, and, in contradistinction to molluscum, in particular by the early essential implication of the corium itself in the new growth.

Etiology.

We are not aware of any remote or proximate exciting cause leading to the production of *Molluscum fibrosum*. It occurs in men and in women of the white and of the coloured races, and commences in early childhood. Virchow reports (*Archiv*, 1 Bd., p. 226) that one patient affected with *Molluscum fibrosum* stated that his father, grandfather, and his brothers and sisters had similar tumours. We cannot, however, prove the hereditariness of the affection.

Hebra has laid special stress on the very interesting fact that all his patients affected with *Molluscum fibrosum* exhibited a peculiar, general, ill-developed condition both of body and mind. "All (of the cases of molluscum which came under our observation) were stunted in bodily growth, and of more or less limited mental capacity." Whether, and in what way, this remarkable fact is connected with the molluscum, whether, namely, it justifies us in regarding the tumours as the expression of a peculiar constitutional malady, of a "dyscrasia," cannot, however, be determined in the least. A "peculiar predisposition," therefore, remains the sole reasonable hypothesis to explain the production of *Molluscum fibrosum*, as well as of many other general disturbances in the nutrition of the body.

Prognosis.

After what we have said in reference to the course of the molluscous tumours, and especially as to their persistence, it will be obvious that there is no very hopeful prospect for the patients, and the more so, as treatment can only give comparative relief. On the other hand, the existence of an immense number of molluscous tumours induces no change whatever in the general state of health of the patient. We must, however, mention Hebra's observation, already quoted, that most of the cases of widely-distributed Molluscum fibrosum occurred in individuals of defective bodily and mental development, and that in a few instances, in course of time, marasmus or tuberculosis became developed and led to the patient's death.

Treatment.

As we are not in the least acquainted with the remote or the proximate causes of molluscum, we cannot take any measures to combat the predisposition to these tumours, nor their development or increase. Those tumours only which are met with singly admit of rational surgical treatment, consisting in their removal, as they particularly interfere with the functional usefulness of a part, and are disfiguring. The pedunculated ones may be ligatured or may be cut off, and the sessile ones excised by means of the scissors, of the *écraseur*, of the knife, or of the galvanic cautery. A plastic operation is in many cases necessary at the same time. In reference to the removal of the pedunculated molluscous tumours, it must not be forgotten that one, or frequently several large vessels are contained in the substance of the peduncle, and may give rise to considerable hæmorrhage, which, in some cases, it may be difficult to check.

CHAPTER L.

(CLASS VIII.—DIV. I.—CONTINUED.)

XANTHOMA.

(*Vitiligoidea*, Addison and Gull—*Xanthelasma*, Er. Wilson.)

THE disease which we are about to describe as Xanthoma, was first mentioned by Rayer. In plate 22, fig. 15, of his *Atlas** there is an illustration of sharply defined, irregularly shaped spots on the eyelids, of a yellowish straw colour, which are designated by him as *Plaques jaunâtres des paupières*, and are described as follows; “On observe quelquefois sur les paupières et dans leur voisinage des plaques jaunâtres, semblables pour la couleur à la peau du chamois, légèrement saillantes, molles, sans chaleur, ni rougeur et quelquefois disposées d’une manière assez symétrique.”

Addison and Gull certainly, therefore, made a mistake when, in their first publication on the subject, in the ‘*Guy’s Hospital Reports*,’† they supposed that the disease had never been previously observed or named by anyone. To them, however, undoubtedly belongs the credit of having first called attention to the peculiar nature of the disease, and of having attracted general attention to the subject by their detailed description.

Under the excusable impression that they were describing a disease which had not previously been described, they designated it with the new name of “*Vitiligoidea*,” which they adopted, because they considered the peculiarities which they met with in the new affection were in some measure alluded to

* ‘*Traité des Maladies de la Peau*,’ 1835, and *Atlas*, Planche, 22, fig. 15.

† “It is doubtful whether this disease has been hitherto described.” “Neither Alibert nor Rayer gives any description which would apply to the cases we have to record.” Addison and Gull, in the ‘*Guy’s Hospital Reports*,’ vol. vii., part ii., second series. London, 1851, p. 266.

in a passage of the description which Willan and Bateman gave of Vitiligo.

- In the 'Guy's Hospital Reports' for 1851, quoted above,
- Addison and Gull published five cases of this disease, accompanied by detailed descriptions and good illustrations. They distinguished two forms of the malady, α , Vitiligoidea plana, and, β , Vitiligoidea tuberosa.* The former was described as "yellowish patches of irregular outline, slightly elevated, and with but little hardness;" the latter, as "tubercles, varying from the size of a pin's head to that of a large pea, isolated or confluent." The two forms might occur separately or might exist in combination on the same individual. Strange to say this interesting publication did not become generally known in England;† in Vienna, however, and elsewhere,‡ due notice was taken of it. It was only when, in the year 1868, the work was republished, with the addition of three cases which had come under observation subsequently,§ that the subject attracted general attention. Since then, cases have been recorded by others, partly under the original designation, and partly under that of Xanthelasma, proposed by Er. Wilson, or of the still better one, introduced by William Frank Smith, of Xanthoma; more especially by Dr. Pavy,|| C. Hilton Fagge,¶ Frank Smith,** Dr. Murchison,†† Hebra,‡‡ Jany and Cohn,§§ Waldeyer,|||

* 'Guy's Hospital Reports,' loc. cit., p. 265, plates i. and ii., and vol. viii., part i., 1852, p. 150 (plate).

† See, for example, Er. Wilson on Skin Diseases, 1863, p. 618, where this affection is mentioned as "Papulæ et laminæ flavæ epithelii cutis."

‡ Bärensprung, 'deutsche Klinik,' 1855, No. 2, p. 17.

§ 'A Collection of the Published Writings of the late Thomas Addison,' edited by Dr. Wilks and Dr. Daldy. London, 1868, New Syd. Soc., vol. 36. 'Journal of Cutaneous Medicine,' Oct. 1868, p. 272.

|| 'Guy's Hospital Reports,' 1866 (reprint).

¶ 'Transactions of the Pathological Society of London,' 1868, xix., p. 434, two plates; (and vol. xxiv., 1873, p. 242.)—Tr.

** 'Journ. of Cutaneous Medicine,' Oct. 1869, p. 241. 'On Xanthoma, or Vitiligoidea,' by William Frank Smith.

†† Pathol. Soc. Meeting on Oct. 20th, 1868 ('Journ. Cut. Med.,' London, 1869, p. 317); ('Path. Trans.,' 1869, vol. xx., p. 187.)—Tr.

‡‡ 'Atlas der Hautkrankh.,' Heft vii., Taf. 10, fig. 1.

§§ Jany and Hermann Cohn, in 'Sitzungsber. der schles. vaterl. Ges.,' Juli, 1868, und 'Jahresb. über d. Fortschr.,' &c., 1869, p. 548.

||| Virchow's Archiv, 1871, 52 Bd., p. 318, Taf. v., figs. 3 and 5.

Geissler,* Hirschberg,† Virchow,‡ and Manz.§ I myself have seen five cases of xanthoma. The very masterly account of the symptomatology of the disease which Addison and Gull gave, has not only been enriched by valuable additions, but also the anatomy of the disease has been more thoroughly determined.

Symptomatology.

The symptoms described by all authors as characteristic of xanthoma agree with those mentioned by Addison and Gull, who were the first to enter into detail on the subject.

There are two forms of the disease—1st, it occurs in the form of yellow patches—Xanthoma planum (Vitiligoidea plana s. flava, Addison and Gull); 2nd, in the form of tubercles—Xanthoma tuberosum (Vitiligoidea tuberosa, Addison and Gull).

1st, Macular Xanthoma. This occurs in the form of sharply defined patches, of an irregular shape, small, or of the size of a finger-nail or larger, of the size of a half-crown, of a yellowish-white, pale yellow, citron-yellow colour, or like that of a faded leaf (coloration feuille-morte). They are either of a uniform tint throughout, or they appear, on closer examination, to be composed of smaller points and spots of a similar colour. In this way very extensive, irregularly-shaped, yellow plaques may be formed. They are either quite flat, or, here and there, raised in the form of little tubercles, especially at the margins. The individual tubercles are smooth and soft to the touch, like the patches on the same level as the skin, and there is no des-

* 'Klinische Monatsblätter für Augenheilkunde,' 1870, Februar-März-Heft, p. 64—a case of Xanthelasma palpebrarum.

† Ibid., Juni-Heft, p. 167—a case of Xanthelasma palpebrarum.

‡ Ueber Xanthelasma multiplex; in dessen Archiv, 1871, 52 Bd., *ibid.*, p. 504, Taf. viii.

§ 'Klinische Monatsblätter für Augenheilk.,' 1871, August-September-Heft, p. 251—a case of Xanthelasma palpebrarum.

The three cases of supposed Xanthelasma palpebrarum associated with amaurosis, reported by Hutchinson in the 'Ophth. Hospital Reports,' vi., 4, pp. 265, 275, and 282, would rather appear to have been cases of milium occurring in groups, and for this reason we shall not add them to this list.

(Hutchinson, 'Med. Chir. Trans.,' vol. liv., 1871, 'Clinical Report on Xanthelasma palpebrarum.' Moxon, 'Path. Trans.,' vol. xxiv., 1873, p. 129. Pye-Smith, *ibid.*, p. 250. Wickham Legg, Path. Soc., Jan. 20th, 1874 'Brit. Med. Journ.,' Feb. 7th.—Tr.)

quamation on the surface. If the portion of skin affected with such a yellow patch is pinched up between the fingers no noticeable difference, either in consistence or thickness, can be detected between it and a fold of the adjacent healthy skin, so that its yellow colour is the only symptom of disease which it exhibits. The patches excite no irritation, but, very rarely, they may give rise to a burning or painful sensation, either spontaneously or on pressure. They occur, for the most part, on the eyelids, upper and lower, on only one or on both belonging to the same eye, or on both eyelids on both sides. They begin, most frequently, near the inner, but it may be the outer, canthus, and gradually spread upwards or downwards, mostly remaining separate, seldom uniting at the canthus. Before long, they involve the adjacent part of the cheek, as far as the skin is very thin. In addition, they may occur on the skin of the nose, of the external ear, and, as I have seen in two cases which came under my observation, on the side of the cheek, and on the front and back of the neck.*

2nd, Tubercular Xanthoma. This occurs in the form of tubercles of the size of millet-seeds, resembling milium, or like

* In the 'Med. Chir. Trans.' (vol. liv.), Mr. Hutchinson records thirty-six cases of *Xanthelasma Palpebrarum*, in a tabular form, together with seven other recorded cases, and also gives illustrations. In regard to the *character of the patches*, he thinks they sometimes present remarkable deviations from the typical buff colour ("chamois-leather"). He has often seen plugs of sebaceous matter projecting from the open orifices of follicles which were surrounded by yellow deposit. In these follicular cases, the parts of skin affected are the same, and the tendency to symmetry is the same. In one instance (Case 11, plate iii., fig. 1) he found groups of serous cysts of considerable size arranged precisely as the patches of xanthelasma usually are, and characteristic yellow patches were interspersed. He attaches great importance to the precise locality affected, as well as to the pathological conditions produced, and he thinks his cases suggest that it is very possible that the same constitutional cause may, now and then, find its expression in the production, on these parts, of conditions bearing little or no resemblance to the ordinary xanthelasma.

The parts affected.—The disease begins near to the inner canthus, attacks the upper and lower eyelids, chiefly the upper. He had not met with any case in which it began at the outer canthus, or on any other part of the face than the eyelids. *Symmetry.*—Always met with in advanced cases, but not at commencement. It generally begins on the *left* side. *Age* (only stated in ten cases), from 28 to 59; average 42. *Sex.*—It is twice as frequent in the female, as in the male, sex (24 out of 36).—Tr.

grains of wheat, of a glistening white or yellowish white colour, isolated or grouped together in compact plaques, hardly or just perceptibly elevated above the level of the skin, or even raised to the height of 1" to 2", and smooth and soft on the surface. They are covered with normal epidermis, are situated in the skin itself, and can only be pinched up between the fingers in company with it. For this reason, they scarcely yield any sense of hardness to the touch, but rather feel somewhat elastic.

They are rarely situated on the eyelids, being more frequently met with on the cheeks and ears, also, however, on the palm of the hand, along the normal folds and lines, on the flexor surfaces of the phalangeal joints, more rarely on the extensor surfaces of the joints of the fingers and of the wrist, on the flexor and extensor surfaces of the toes, and on the sole of the foot.

In still rarer cases of, in some measure, general distribution of the disease,* it is met with in various other parts of the body, even on the hairy scalp, in the bends of the knees (Græfe and Virchow's case), on the back of the elbow (Case 4 of Addison and Gull, Pl. ii., fig. 2). I have myself seen about thirty isolated tubercles, about the size of grains of wheat, on the root of the penis of a young man.

In a few cases, macular and tuberous xanthoma have been observed on the mucous membrane of the lips and cheeks, and of the nose, and on the gums (Fagge, Frank Smith, Hebrat†).

As a rule, the sensitiveness of the tubercles to pressure is as slightly increased as in the case of the patches before mentioned. Occasionally, however, the tubercles, and especially those situated on the fingers and palm of the hand, and those on the sole of the foot and on the toes are very painful, so that contact with surrounding objects, grasping and handling, walking and standing, sitting down and getting up, are accompanied by exceedingly tormenting pricking and burning pains.

* It is remarkable that in this form, and especially when situated on the hands and feet, xanthoma has hitherto only been met with in England, and has occurred there with comparative frequency. In the case of Græfe and Virchow, however, the xanthoma was undoubtedly multiple.

† From an oral communication.

(The mucous membrane of the larynx, the lining membranes of the heart and blood-vessels (Fagge); the mucous lining of the hepatic ducts and the surface of the spleen (Pye-Smith), and the sides of the tongue (Wickham Legg).—Tr.)

Development and Course.

From the mode of development and the course of xanthoma, we ascertain that the two forms described are identical. They not only become developed in the same individual, under similar circumstances, and exist side by side, but the macular xanthoma becomes at some points, especially at its borders, of a tubercular form (Case 4 of Addison and Gull).

Xanthoma develops from one or several points in the macular form, and then gradually passes into the tubercular form, or it originates primarily in the latter form. The separate plaques enlarge in the course of months and years by irregular peripheral growth, apparently by the addition of new punctate spots and tubercles to the circumference; their further growth becomes arrested, and they then remain unchanged for the rest of the patient's lifetime. It has, however, been noticed that the yellowish-white colour of the tubercles in the palm of the hand and flexures of the fingers becomes changed, in course of time, to a brown colour.

Xanthoma, whether in the form of yellow patches or of tubercles, does not undergo any other changes, even after it has existed for years, that is to say, it never ulcerates. It has not been shown to exercise any injurious influence on the general organism.

As a complication or modification of the process it must be mentioned that tubercles of xanthoma have been met with not only in the skin, but also, at the same time, in the tendons of the extensors of the fingers, and, therefore, subcutaneously, and interfering with the movements of the tendons beneath the skin. (Case 1 of Gull and Pavy, loc. cit.)

Subjective Symptoms.

These consist, only, of the painfulness of xanthoma when situated on the hands and feet. The flat patches on the eyelids, cheeks, and neck are a source of great disfigurement, on account of their striking yellow colour. Tubercous xanthoma of the eyelids is also troublesome, on account of the heaviness and size of the nodules, for, on the one hand, they diminish the mobility of the eyelids, and, on the other hand, by their weight cause a drooping of the upper lids, and may, by this means, interfere with vision.

Etiology.

No cause can be assigned for this mysterious affection of the skin. There is one influence, however, which we must not overlook, and which attracts our notice comparatively often, in reviewing the cases recorded by authors, and those which have come under our own observation, that is, *icterus*.*

Of the five cases mentioned in the original publication of Addison and Gull it happened that three were associated with jaundice. As, however, there was no evident connexion to be made out between the icterus and the xanthoma, and as in two of the cases no jaundice had occurred, the icterus in the other three cases was regarded as being probably accidental. At the present time, when the anatomy of xanthoma is certainly better known than at the time at which Addison and Gull's article was written, no relation can be shown to exist between xanthoma and jaundice, except a similarity of colour; but it is less allowable than

* Hutchinson (loc. cit.) calls attention to the frequent association of Xanthelasma Palpebrarum with "*sick headaches*," and other curious symptoms of functional derangement of the nervous system. In fifteen out of the thirty-six cases, there was a history of sick headaches of great severity; whilst, in six others, the same symptom had occurred, but with less violence. One patient, a man, was liable to attacks of temporary blindness, from which he recovered, usually, within a few minutes. At length, one of these left him permanently blind of one eye, without any ocular changes discoverable by the ophthalmoscope. Sometimes one and sometimes the other eye had been affected. After the attack, a violent sick headache always followed. In another case, an unmarried lady had been liable to attacks in which she lost the use of her hands completely for a time. She also complained of numbness, followed by sick headaches. A third patient, a woman, had been liable to numbness of the hands and feet, and on one occasion was blind for a time. A fourth, a gentleman, became insane (this case is given in full). It is noted that these nervous symptoms are such as occur with sick headaches. *Jaundice* was present in six of his thirty-six cases. "It seems clear that when the disease affects the general surface, the constitutional symptoms, and especially the hepatic disorder, are much aggravated."

Mr. Hutchinson thinks that the proportion of those in his series who had suffered severely from sick headaches is in large excess of what happens in the population generally, whilst, in most, they had been also of unusual severity. In about one-third they had not occurred in any remarkable degree, and these patients considered themselves in very good health; many of them were far advanced in life. "Whilst, therefore, it is, I think, impossible to avoid the conclusion that xanthelasma of the eyelids does, in a majority of cases, indicate liability to disturbance in the function of the liver, we are bound to admit that in a not inconsiderable proportion this

ever to ignore the frequent association of xanthoma with jaundice, owing to the greatly increased number of such cases.* In 30 cases of undoubted xanthoma which I have collected together, jaundice occurred in 15.

The cases are as follow :

	No. of Cases of				Icterus.
	Xanthoma.				
Addison and Gull	-	-	-	8	6 times
Bärensprung	-	-	-	3	0
Pavy	-	-	-	1	1
Fagge	-	-	-	2	2
Murchison	-	-	-	1	1
Frank Smith	-	-	-	1	1
Jany, Cohn, Waldeyer	-	-	-	1	0
Virchow, Græfe	-	-	-	1	0
Barlow's case (in Dr. Fagge's Paper)	-	-	-	1	1
Geissler	-	-	-	1	0
Hirschberg	-	-	-	1	1
Manz	-	-	-	1	0
Hebra and myself	-	-	-	8	2
Total	-	-	-	30	15

liability is quite compatible with long life and a fair average of health." "I have sometimes been tempted to suspect that xanthelasma of the eyelids stands in some relation to the temporary attacks of dusky pigmentation of those parts which is so well known to occur in connexion with temporary derangements, both of liver and uterus." "It is just possible that it is, after all, chiefly a senile change in cell-structures which have been in former times very often the seat of temporary deviations from normal nutrition." Many patients show permanent excessive pigmentation as well as xanthelasma. Probably an explanation of the greater frequency of xanthelasma in females, and of its occurrence without evidence of biliary derangement, may be found in reflex disturbance (sick or nervous headaches, dark areolæ around the eyes, &c.), starting from the generative organs. In two cases, menstruation ceased early. In the case of a medical friend, dark patches around the eyes were always noticed when he was over-fatigued or out of health, though he has never had sick headaches. Mr. Hutchinson does not think the patches of xanthelasma disappear. Spontaneous subsidence would throw doubt on the diagnosis.

He calls attention to two cases of Xanthelasma palpebrarum, in which *great* enlargement of the liver, associated with jaundice, lasting for a long time, had occurred. In both instances, the patients, at time of note, were in good health, the jaundice gone, the liver of normal size, and nothing left but the patches on the eyelids. These are the only two cases noted, so far as he is aware.—Tr.

* See the cases of Pye-Smith, Moxon, and Wickham Legg, further on.—Tr.

In the fifteen cases of xanthoma in which jaundice had occurred, the relation of the latter to the skin affection was not always the same. In some of the patients (as in my Case 4) the xanthoma did not appear till many years after the attack of jaundice; on the other hand (my Case 1) jaundice did not occur till the xanthoma had existed for more than a year.* These circumstances, together with the unmistakeable fact that in almost one-half the cases of xanthoma on record, jaundice was entirely absent, render it impossible that we should advocate the acceptance of the existence of a relation between the latter and xanthoma. Moreover, it is quite impossible to explain the real nature of such a mutual relation if we consider the anatomical conditions met with in xanthoma (see Anatomy).

* The comparative infrequency of this malady, and the hope that the larger the number of cases published, the greater will be the amount of material afforded for the solution of the mystery in which the essential nature of the disease is enveloped, even at the present time, are my apology for the publication here of the eight cases which came under my own observation.

CASE I.—A woman, about 40 years of age, from Görz, had large patches of xanthoma, of a citron-yellow colour, on the right side of the neck, spreading backwards and forwards, and on the cheek. She had never suffered from jaundice. A year later, she again presented herself among Prof. Hebra's out-patients, on her road to Karlsbad, where she was going on account of a severe attack of jaundice which had developed in the interim. The patches of xanthoma had increased in size.

CASE II.—In a man, about 35 years of age, from Vienna, of healthy appearance, who also suffered from psoriasis, I saw an extensive patch of Xanthoma planum, of a citron-yellow colour, on the right side of the neck. He had not suffered from jaundice.

CASE III.—In a man, about 40 years of age, from Pest, there was a patch of xanthoma of the size of the thumb-nail, of a citron-yellow colour, on the left cheek, beneath the lower eyelid. There had been no jaundice.

CASE IV.—Xanthoma planum in a patient (shown at the meeting of the k. k. Ges. der Ärzte in Vienna, on Dec. 29, 1871) in Prof. Hebra's Clinique. She is 40 years of age, and suffers from a syphilitic ulcer of the left leg, the infection causing which dates only from the last few years; for the patient has borne nine children, of whom the first five are living, whilst of the four later ones, three were still-born, and the fourth died at the age of three days. In her sixteenth year she suffered for seven weeks from jaundice; the xanthoma, however, had only developed four years before she came under care.

On the upper and lower eyelids, on both sides, there were flat patches

Frank Smith and Fagge, however, have had recourse to hypothesis to establish the possibility of the affection of the liver and the jaundice being of importance as causes of xanthoma. Fagge found in the two cases observed by himself and in Barlow's case, a considerable and painful swelling of the liver, reaching as far as the navel, and states that, in spite of the existence of jaundice, the fæces were stained with bile. On the basis of this statement, Frank Smith thought himself justified in supposing that the jaundice present in the cases named was an "*Icterus sui generis*," "a pigment jaundice alone," that only a part of the bile-pigment, retained not by mechanical but by functional disturbance, found its way from the liver into the blood, whilst the other constituents of the bile were excreted without alteration.

Murchison has furnished the results of a post-mortem examination of a case of xanthoma—the only one on record. The liver appeared to be in a condition of commencing cirrhosis. It was very firm, and, on section, showed a smooth, dense surface of a pale greyish colour. Here and there were yellowish spots which were found to consist of hepatic lobules, the cells of which were loaded with oil and bile-pigment. The chief mass of the liver was made up of fibres and nuclei (the latter being specially

of xanthoma, of the size of a finger-nail, extending upwards and downwards from the inner and outer canthi.

There were also a number of tubercles of milium scattered over the cheeks, which could be easily picked out with a needle, and, when rubbed between the fingers, were found to consist of a friable, granular mass, and under the microscope were shown to be made up of epithelial structures and fat-crystals.

CASE V.—In a man, aged 24, who had never suffered from jaundice, in the form of tubercles, resembling grains of wheat, on the root of the penis.

CASE VI.—A governess, 40 years of age, from Vienna. Xanthoma planum on both eyelids. No jaundice. The patient had had repeated attacks of Erythema urticatum and iris. I cut out the patches.

CASE VII.—A woman, about 50 years of age. Xanthoma of the eyelids. No jaundice.

CASE VIII.—A man, about 45 years of age. Xanthoma palpebrarum. No jaundice. On the palms of both hands there was a copious eruption of wart-like patches closely resembling those described by English authors, and which disappeared after many months under the influence of softening applications (caoutchouc-gloves, soft soap, &c.).

abundant), situated in the portal canals and between the lobules.*

* In the Path. Trans. for 1873 (vol. xxiv.), Dr. Moxon, Dr. Hilton Fagge, and Dr. Pye-Smith have recorded the results of post-mortem examinations.

Dr. Moxon's patient (loc. cit., p. 129) was a man, aged 32. He had been deeply jaundiced for rather more than twelve months. "Xanthelasma was plentifully developed in hands, scrotum, and back especially." After death it is noted: "Xanthelasmic patches on the hands, in the palms and in the bends of the knuckles especially, also on the ears and cheeks, little on the eyelids; a considerable mottling of it on the back; but the most marked production of the change was in the scrotum. Pigment had disappeared wherever the xanthelasma was developed, but there was nigrities of other parts." The liver was in a state of early cirrhosis. The gall-ducts were much dilated, and "had xanthelasmic-looking patches within them—that is, white, opaque patches." There was a simple stricture of the hepatic duct. Dr. Moxon remarks that this case is of interest from the fact that it is the first which clearly showed xanthelasma to be the sequence of chronic jaundice, and not, as was supposed, a special cachexia involving the liver and skin in some peculiar disorder. It is true, we do not know what is the reason why chronic jaundice should cause xanthelasma, but we know enough from the present case, together with those recently noted by Dr. Fagge and Dr. Pye-Smith, to infer that chronic jaundice, whatever its cause, is liable to induce xanthelasma.

Dr. Fagge's case (p. 242) was one of those above noted (see also vol. i. of the present work, foot-note, p. 129). The patient, L. L., a female, had had jaundice for seven years, and the immediate cause of her death was hæmatemesis. During life, xanthelasmic patches had been noticed round the eyes, on the backs of the hands, and on the abdomen. At the post-mortem, the *mucous membrane of the larynx* was found to be affected in the same way as the skin. Just below the vocal cord there was, on each side, a cream-coloured patch of considerable size, and others existed all along the trachea, forming transverse bars, situated rather over than between the cartilages, and chiefly towards their posterior ends. There were other patches also on the mucous membrane of the posterior muscular part of the tube. The affection extended as low as the bifurcation. In the lining membrane of the left auricle of the heart were two or three small, round, or oval yellow spots, quite soft, but looking raised. There were other patches in the aorta and pulmonary artery. The liver was in a state of cirrhosis. The surface of the spleen showed a number of minute white grains. The microscopic examination is given further on. Dr. Fagge thought his case showed, more conclusively than Dr. Murchison's, that cirrhosis was the condition of liver associated with xanthelasma, because in Dr. Murchison's case the patient was intemperate, and the cirrhosis may have been due to this cause, and also the xanthelasma was limited to the eyelids. He thinks it has been shown of late years (by Hutchinson, &c.), that the skin of the eyelids is liable to present this peculiar change without there being any tendency to

In some cases of xanthoma, albuminuria has been temporarily observed.*

the occurrence of xanthelasma in other parts, and without the existence of jaundice or (definite) hepatic disease. He himself has recorded two cases. In one, in a lady, the condition was said to have occurred in four successive generations. He was led at one time to conclude that the jaundice and the disease of the liver were both of a peculiar character in xanthelasma. Dr. Pye-Smith's case and Dr. Moxon's case have shown him that very different conditions of liver, if they give rise to continued jaundice, may lead to the development of xanthelasma in the skin and mucous membrane. As regards the Xanthelasma palpebrarum, he admits the constant association with "bilious (sick) headaches" (pointed out by Mr. Hutchinson), and suggests that these are now generally regarded as of a nervous character. He thinks the xanthelasma comparable to the changes in the colour of the eyebrows, pointed out by Dr. Anstie to be dependent upon neuralgic attacks. He notes a marked case of Xanthelasma palpebrarum in a lady of middle age. Both upper eyelids were affected, and above the right inner canthus was a small cyst-like body such as Mr. Hutchinson has described and figured. She was very subject to headaches, which generally began with loss of sight, and were frequently attended with a numb feeling in the hand, &c. She had hemiopia. The headaches were clearly neuralgic. He therefore regards this form of xanthelasma as due to perverted nervous influence. General xanthelasma (in the skin, mucous membranes, and blood-vessels) he attributes to a morbid state of the blood caused by jaundice—the latter not being of a peculiar character, nor dependent on any particular affection of the liver.

Dr. Pye-Smith's patient (p. 250) was a woman, aged 49. She had been jaundiced about twelve months. There were patches of xanthelasma (*Vitiligoidea plana*) on the eyelids and hands. At the post-mortem, similar patches were found on *the surface of the spleen* and in the mucous membrane of the dilated hepatic ducts. The liver was slightly cirrhotic, not comparable in degree to the condition met with in Dr. Murchison's and Dr. Fagge's cases, but then there were no xanthelasmic nodules (*Vitiligoidea tuberosa*) as in the latter case. The biliary ducts were much dilated, and there was a calculus in the gall-bladder. Dr. Pye-Smith mentions two cases of "simple" xanthelasma limited to the eyelids and adjacent parts, without jaundice.

Dr. Wickham Legg brought a case of Hydatids under the notice of the Path. Soc. (Jan. 20th, 1874), in which the patient, a man, had been deeply jaundiced for ten months. He had xanthelasma of the face; and, *along the sides of the tongue*, there were three or four yellowish-white spots, somewhat raised, soft, and symmetrical. A cyst was found to press on the hepatic duct.—Tr.

* Hutchinson (loc. cit.) remarks that the two cases of *Vitiligo tuberosa* which have been recorded in association with *diabetes*, in which the eruption came out suddenly, presented marked differences from ordinary xanthel-

Anatomy.

Pavy (loc. cit.) was the first to examine both the flat (macular) and the tuberous forms of xanthoma more closely, anatomically, and to arrive at a definite result.

According to him, xanthoma, in all its forms, consists of a (fibrous) connective-tissue new growth within the corium, with deposition of granules and globules of oil in the cells, and interstices of the connective tissue. The yellow colour of the new growth does not depend on bile-pigment, but is caused solely by the fatty degeneration.

The statements of all who have subsequently examined xanthoma microscopically agree with Pavy's results. Fagge, Murchison, Frank Smith, Waldeyer, and Virchow* support the observations of Pavy, and so, also, can I myself from my own examinations.

If we cut through a patch of skin affected with Xanthoma planum, the cut surface appears unequally coloured, of a pale red, with yellow spots interspersed. If we compress the cut border between the nails, we can squeeze out a small quantity of bloody-serous fluid, but no granules at all resembling those of milium. The yellowish patches cannot be made to disappear by pressure. These, as well as other parts of the skin, show a more or less densely fibrillated structure. On examining thin sections of portions of skin affected with Xanthoma palpebrarum under the microscope, the epidermic and papillary layers appear normal. In the cells of the deeper layers of the rete there is an abundance of yellowish-brown pigment. This is also found distributed abundantly in many parts of the corium, either free or contained in stellate cells. In the corium, there is also asma, and also showed a tendency to cure, are, in all probability, examples of a distinct malady. Dr. Hilton Fagge has arrived at much the same opinion.—Tr.

* Pye-Smith and Wickham Legg also agree with previous observers. In the report of the post-mortem of Dr. Fagge's case ('Path. Trans.,' xxiv., p. 244) is an account of a detailed microscopic examination by Mr. Howse. He found the changes the same everywhere, and regards them as identical with those found in the early stages of atheroma. Dr. Fagge says: "Thus, it would be a matter of indifference whether we should speak of the cutaneous disease as an atheroma of the skin, or of the arterial affection as a xanthelasma of the aorta." Dr. Pye-Smith also regards atheroma and xanthelasma as identical histologically.—Tr.

found connective tissue distributed unequally, in foci, as it were, partly rich in cells, and partly fibrous and poor in cells. This is met with, for the most part, around the hair follicles and sebaceous glands, whose walls, for this reason, appear thickened. The stellate cells (connective-tissue corpuscles) also appear distributed, without any regular arrangement, in strikingly greater numbers than in the normal state, and there are also groups of roundish cells, with highly refractive nuclei, infiltrated here and there. Under the microscope, we can distinctly recognise portions which are of normal colour, or which are tinted red when treated with carmine, and others which appear yellow when treated in the same way. The yellow colour is connected with the isolated foci of the densely fibrous connective-tissue new growth. The individual connective-tissue corpuscles also have a golden-yellow tint. The yellow colour arises from the fat which appears deposited in the individual cells and bundles of fibres, as a coarsely granular, yellow mass, or in larger globules, but fat is also deposited in and between the bundles of fibres of the older connective tissue, in the form of large yellow, glistening oil-globules. Such bundles of fibres simulate convoluted sweat glands or coils of intestine attached to the mesentery. In addition to the peculiar colour, and the formation of large oil-globules, the fatty change in xanthoma is also characterised by the fact insisted on by Waldeyer and Virchow, that it does not resemble a fatty degeneration of the affected tissue elements, but represents a true deposition, which appears to be of a rather harmless character; for the formed elements, infiltrated in this way with fat, are, in other respects, organically unchanged, and, therefore, continue to live, and are functionally active.

According to the microscopical conditions here detailed, xanthoma is to be regarded, anatomically, as an interstitial connective-tissue new growth with deposition of fat, of a yellowish colour, in the tissue elements.

Nevertheless, we do not think the name *Fibroma Lipomatodes*, proposed by Virchow for this disease, on the ground of the conditions found anatomically, to be suitable, and think the designation *Xanthoma* far more preferable.

Diagnosis.

The similarity between xanthoma and aggregations of

granules of milium cannot be doubted.* The two may, on this account, often be confounded.† It also accounts for the fact, that Wilson and Hebra originally advocated the identity of the two affections. They have, however, already given up this opinion. A confusion between the two is the more likely to happen because milium granules are often met with, either isolated or in groups, on, and in the neighbourhood of, xanthoma.‡ The latter can very easily be distinguished from xanthoma, however, because the granules of milium can be very easily squeezed out *in toto* (little round bodies) from their nests, after a superficial cut has been made into them, whilst the xanthoma, even if the skin be wholly divided, cannot be separated from the tissue of the corium.

Treatment.

If left undisturbed, xanthoma shows no tendency to involution, but persists unchanged. Neither are we able to cause its absorption by the use of any external or internal medication.

If we wish to remove the disfiguring patches or tubercles, there is only one plan of procedure to be adopted—excision. The whole of the portion of skin affected with xanthoma must be excised down to the subcutaneous tissue, for it is infiltrated with the new growth, and the latter cannot be enucleated. As, however, xanthoma occurs most frequently on the eyelids, where the excision of large portions of skin is a very critical matter, owing to the danger of producing ectropion, or of leaving a deficient covering for the cornea, recourse must be had with great caution to this radical measure.§

* See Rayer's Atlas, Plate viii., fig. 16 (Plaques folliculeuses).

† Hutchinson's cases.

‡ See my fourth Case. This occurs more especially in elderly people, and accords with the enlargement of the sebaceous glands described by Geber and O. Simon (in a paper on my fourth Case in the 'Archiv f. Dermatol. und Syph.' 1872, 2 Heft, u. Taf.); and Neumann ('Lehrb. d. Hautkr.', p. 89, 3 Aufl.). I am not at all disposed, however, to recognise two varieties of xanthoma, as the two authors first named have done, and still less to make use, as Neumann proposes, of two names for them which do not correspond to clinical characters, but, at most, only to histological conditions.

§ Hebra cut out a xanthomatous patch from the right lower eyelid of a patient (my fourth Case) with scissors. The wound has healed, leaving a flat scar, and no ectropion has resulted. I have since done the same in some cases with good effect.

CHAPTER LI.

(CLASS VIII.—DIV. II.)

NEW GROWTHS COMPOSED OF VESSELS.

Angiomata.

UNDER this term are included those pathological alterations of the skin which consist, either wholly or in great part, of permanently enlarged and newly formed vessels. They are divided into those which contain *blood-vessels*, and those which contain *lymphatics*.

NEW GROWTHS COMPOSED OF BLOOD-VESSELS (*Angiomata propria*).

General Characters.

All angiomata are characterised by the fact that they show, more or less distinctly, by their clinical peculiarities, that they are made up of blood-vessels. They are mostly of the colour and general appearance which pertains to vessels filled with blood, disappear when compressed by the finger, and assume the same aspect as before as soon as ever the pressure is removed.

They, however, exhibit many varieties in regard to shades of colour, size, configuration, their topographical and histological conditions, their clinical course, and their special importance in relation to the particular organ affected, and the individual.

They may, therefore, be divided into many species and varieties, which, indeed, has been done by different authors, as may be seen in the very abundant ancient and modern literature of the subject.*

* See, in the first place, the copious bibliography in Virchow's important treatise on Angioma in his 'Geschwülste,' iii. Bd., pp. 307-469, Berlin 1867. In addition, see, especially, Plenck, 'Doctrina de Morbis Cutaneis,' Viennæ,

It will, however, be quite sufficient, from a dermatological point of view, and will answer all practical purposes, if we divide the growths consisting of (blood) vessels into four subdivisions, as, 1, Telangiectasis; 2, *Nævus vasoularis* (Gefässmal); 3, *Angio-Elephantiasis*; 4, *Tumor cavernosus*.

1. TELANGIECTASIS.

Tumours consisting of dilated and newly formed capillaries* and finest divisions of the cutaneous vessels,† and arising in the course of extra-uterine life, that is, acquired, are termed Telangiectases.

Telangiectases may be divided into (a) idiopathic, and (b) symptomatic.

(a) *Idiopathic Telangiectases.*

They are primary affections, possessing the characters common to the telangiectases in general.

Symptoms.—They make their appearance as spots on the skin, of a bright red or dark violet colour, and of the size of a pin's head, or somewhat larger, or as rather prominent, reddish nodules; occasionally they are met with in the form of tortuous, single or ramified lines, of varying shades of colour.

Not infrequently these different forms are variously combined. Thus, for instance, it may happen that a spot, of the

1793, p. 37; Fuchs, 'Die krankhaften Veränderungen der Haut und ihrer Anhänge,' Göttingen 1840, i. B., p. 25; Chelius, 'Handb. d. Chir.,' i. B., ii. Abth., p. 980, Wien, 1844; Schuh, 'Pseudoplasmen,' Wien 1854, p. 153; Rokitsky, 'pathol. Anat.,' Wien 1855, i. B., p. 203, und ii. B., p. 72; v. Bärensprung, 'Beiträge zur Anat. u. Pathol. d. Htkr.,' &c., Leipzig 1848, p. 61; Wedl, Sitzungsab. d. k. Ak. d. W., liii. B., 'Beiträge zur Pathologie der Blutgefäße,' iii. Abth., p. 28; Lücke, in 'allg. und spec. Chirurg. von Pitha-Billroth,' ii. B., i. Abth., 2 Heft, Erlangen 1869, p. 261; O. Weber, *ibid.*, iii. B., i. Abth., 2 Lief., p. 109; Billroth, 'Vorles. über Geschwülste,' Berlin 1868, p. 45, und 'allgem. Chirurg.,' 4 Aufl., p. 649, and also 'Untersuchungen über die Entwicklung der Blutgefäße,' Berlin 1856.

* Capillary varices according to Cruveilhier (Virchow, loc. cit., p. 423).

† We leave out of consideration, therefore, those dilatations and, in part, new growths of the larger vascular trunks known as Varices proper, and occurring so frequently on the lower extremities, around the anus (*Hæmorrhoids*), in connexion with the vessels of the spermatic cord (*Varicocele*) and in other localities.

size of a lentil or of a sixpence, and of a uniform red tint or marbled, may be crossed by lines of vessels which are more strongly marked. Or, the centre of a flat, macular telangiectasis may be elevated, in the form of a more or less prominent nodule of a deeper tint of red. The nodule is surrounded by a halo of congestion. Occasionally isolated, tortuous, red lines may pass from the periphery to the nodule.

Now and then telangiectases are met with in the form of prominences of the size of lentils or peas, or larger, of a bright or dark red colour, and soft, elastic consistence, and having a smooth, or slightly tuberculated surface, resembling that of a blackberry. They are easily compressible, but resume their original size as soon as the pressure of the finger is removed. Several such telangiectases may be united together so as to form turgescant* structures, covering a large surface, and resembling the varicosities of the larger veins.

Diagnosis.

There is no difficulty in recognising that these variously-shaped red patches correspond to enlarged small cutaneous vessels and their finest ramifications. They disappear on pressure from the finger, but again return as soon as the pressure is removed, and the contour of the individual vessels may often be easily recognised. The absence of any symptom of inflammation, of swelling, or of an elevated temperature, and the uniform and chronic duration, prevent any confusion arising between telangiectasis and transitory hyperæmia or inflammatory redness. Moreover, the turgescant telangiectases may be distinguished from fluctuating small abscesses and cysts, by their having mostly a dark blue colour, by their connexion with the surrounding tissue-network, their persistence, and their painlessness.

Mode of Occurrence, Localisation.

Telangiectases occur in persons of both sexes, often in young people, but much more frequently, it must be admitted, in more advanced life. They may be met with in the form of red patches, nodules, and serpentine lines, on any part of the body.

* "Turgescirenden"; not quite, though nearly the same as erectile; used frequently in this chapter to indicate compressibility and power of expanding.—Tr.

They are only of importance, however, when they occur in localities which, as a rule, are not covered by any part of the dress—such as the hands, front and back of the neck, shoulders, and especially the face, where they become developed, singly or in numbers, on the nose and its neighbourhood, on the eyelids and cheeks. To this category belong those telangiectases which occur on the cheeks of old people, as a rule, occasionally, however, in young persons, and give a marbled or veined appearance to the parts affected. Owing to the abnormal redness, which attracts attention in comparison with the tint of the normal skin, these affections, in the situations last mentioned, lead to a disfigurement which is exceedingly annoying to young persons, and especially to females. The prominent, berry, or wart-like telangiectases described above, mostly occur on the lips, on the red border of the lips, and spread thence to the mucous membrane of the cheeks and lips. They are not only very visible on the lips, and, for this reason, a source of annoyance to those affected with them, but they are also troublesome on account of their liability to injury. They are often excoriated on the surface, in mastication or from scratching, weep and become covered with crusts, or deeper fissures are formed, or the swellings burst, and severe hæmorrhage results, which is very difficult to arrest.

Cause, Development, Course.

The telangiectases, as a rule, develop without any apparent cause, and without any marked accompanying symptoms. Occasionally, however, a puncture with a needle or the fine point of a knife may give rise to them, and especially to the punctate and nodular telangiectases. Having once become developed, the dilatation of vessels may go on increasing, though almost imperceptibly, for months or years. This applies, especially, to the turgescient form of vascular halo surrounding a nodular telangiectasis. For the most part, when they have once attained a certain size, they remain without any further change. All forms of telangiectasis may, however, undergo spontaneous involution.

(b) Symptomatic Telangiectases.

These are transitory or permanent dilatations or new growths

of vessels, which either represent an essential symptom, or a somewhat unimportant complication of some other disease of the skin; or become developed in consequence of local or general disturbance of the circulation.

To the first category belong the telangiectases which, in the form of a rather diffuse bluish redness of the tip of the nose, represent the slightest degree of acne rosacea; or in the form of red, tortuous, vein-like lines, traverse a diffusely reddened area; they are especially met with in great abundance, in the severer forms of acne rosacea, in the region and at the circumference of the tubercles and tumours, and give to them their characteristic variegated red appearance. Frequently, however, diffuse and veined telangiectases are developed within and at the periphery of cutaneous scars, whether due to cauterisation, burns, ulcerations, Lupus vulgaris, or Lupus erythematosus, &c. Around the isolated papules, as well as around the groups, in a case of Lichen ruber, we saw distinct telangiectases. We have often observed the like around eruptions of Lupus erythematosus and on the borders of the discoid patches. The numerous telangiectases disappeared at the same time as the lupus patches.

To the second group of symptomatic and secondary telangiectases belong those which become developed at a distance from, or in the neighbourhood of, tumours of all sorts, owing to the stretching and compression of the cutaneous vessels and to the obstruction to the circulation which result (also on the abdomen, in consequence of a pregnant uterus). Lastly, the marbled dilatations of the capillaries of the cheeks, resembling the senile idiopathic telangiectases, and produced by organic affections of the heart, interfering with the general circulation.

These telangiectases always occur in the form of tortuous lines, red spots, or nodules. Their persistence depends on the duration and the nature of the affection which lead to their production; at one time, though, perhaps, not till after they have existed for a long while, they may completely disappear; whilst at another time, they may remain unaltered for the rest of the patient's life.

Treatment.

As a rule, it is only when the dilated vessels are situated on

the face and on parts of the body which are usually uncovered (the hands, bust) that we are called upon to treat them.

The most efficient and eventually least hurtful procedure is that which has been already described under the head of Treatment of Acne Rosacea (see vol. ii., p. 333, of this work), and in which the visibly dilated vessels are superficially incised with a fine scalpel, and charpie dipped in a weak solution of perchloride of iron (one scruple to an ounce of distilled water), or in a concentrated solution of nitrate of silver (equal parts of the nitrate and of water), is placed over the bleeding points. Owing to the action of the fluids named, the bleeding will be checked at once, and the vessels will become obliterated. The slight wounds produced by the cuts heal within twenty-four hours, without leaving any traces behind. We are very frequently called upon to treat small, nodular telangiectases, occurring in an isolated form, on the face of a person having a normal tint of complexion otherwise, especially in young girls and women, owing to the very remarkable and disfiguring appearance they produce. It will not, perhaps, be superfluous to mention that the plan described is not always attended by success, and, therefore, a cure cannot be promised with certainty. For instance, in the case of a telangiectatic nodule surrounded by a halo of vessels, after destruction of the latter, by means of incisions and cauterisations with nitrate of silver, an increase in the area of the halo of dilated vessels results, and the patients then have a central white spot in the midst of a large, red, circular area, instead of a prominent red nodule with a small halo. The disfigurement is, therefore, only so much the greater. Patients should be made acquainted beforehand with the possibility of this occurrence. Sometimes telangiectases which have only recently become developed in the skin (around scars, in acne, lupus, &c.) may be caused to disappear by artificially setting up an inflammatory condition in the skin. For this purpose, methodical paintings with glycerine of iodine, tincture of iodine, sulphur paste, the application of Emp. Hydrarg., &c., as has been already detailed in the chapter on "Scars" (p. 322 of the present volume), may be employed.

2. NÆVUS VASCULARIS (*Gefässmal*).

Nævus vasculosus, Nævus flammeus, N. sanguineus, Blutmal, Feuermal.

Under the term *Nævi vasculares* we include spots which are congenital, or which become more perceptible immediately after birth, are confined to single regions of the body,* are persistent, become pale on pressure with the finger, and are of various tints of red, and, also, tumour-like, cutaneous formations of the same colour, which, according to their clinical aspect, correspond to dilatation or new growth of capillaries and the smaller cutaneous vessels.

Nævus either appears in the form of spots variously tinted of a red colour, *Nævus vascularis simplex*, *Angioma simplex* (Virchow), *N. vascularis telangiectodes*, *Tâche de feu*; or in the form of more prominent, tumour-like formations which may be grasped with the fingers, *Angioma prominens*, *Nævus tuberosus*, *Angioma cavernosum* (Virchow). There is no strict line of demarcation, naturally, between these two forms, and they cannot be absolutely distinguished from one another, for they very often exist in combination or interspersed. Each of them, however, when isolated, occurs in a perfectly characteristic form.

At one time, *nævus* presents the appearance of bright red, or dark red, or even bluish or steel grey, or livid spots on the skin, which are of the size of a pin's head, lentil, half-crown, or of the palm of the hand, or spread over extensive tracts; they become pale, for a time, under the pressure of the finger, are of a uniform or variegated tint, quite flat or slightly elevated, and covered with epidermis, which shows no appreciable alteration.

At another time, it takes the form of a patch of a uniform red colour, or traversed by distinctly perceptible, tortuous, and highly injected blood-vessels; occasionally it appears as a fluid diffused in the substance of the skin, of varying shades of red,

* We therefore exclude that universal capillary dilatation which belongs to congenital cyanosis dependent on well-known anomalies of the heart and the origins of the great vessels.

and necessarily having an even surface* ; or, again, it is either, as a whole, slightly elevated, or it only, here and there, shows reddish or violet nodules elevated above the level of the surrounding skin.

Lastly, the nævi may be slightly tuberculated throughout their whole extent, having irregular projections, one or several lines in height, and of a bright or dark red colour. They then have a tumour-like aspect and communicate a sense of soft elasticity and turgescence to the fingers ; they are easily compressed, but swell out again directly as soon as ever the pressure is removed. The latter kind of nævi not infrequently exhibit the phenomenon of pulsation, especially when situated on the head. On account of their possessing a turgescient character, and of their communicating a soft, spongy sensation to the touch, they have been described as fungus hæmatodes (by the older authors), as venous telangiectases (Schuh), erectile vascular tumours (Dupuytren), aneurysma spongiosum, as lobulated vascular fungus (Rokitansky, Schuh), and, on account of their peculiar internal structure, as angioma cavernosum (Virchow).

On a superficial inspection, nævi appear sharply defined, because, owing to their remarkable colour, they contrast very strongly with the comparatively pale colour of the adjacent skin. On closer examination, however, the borders of the macular nævi seem ill-defined (as if washed out), and are gradually lost in the normal colour of the surrounding skin. And even the tuberous nævi may be traced by means of the fingers from their apparently well-defined base, into the deeper parts of the corium, and even into the subcutaneous tissue.

Seat, Number.

The situation in which they are most frequently met with is the head, on the face, cheeks, nose, eyelids, brow, and the hairy scalp. They frequently occur, however, on the upper extremities, both flexor and extensor surfaces, on the backs of the hands, on the trunk, on the penis, and on the labia ; rarely on the lower extremities. Nævi are generally isolated, but several very often occur on the same individual. Occasionally

* *Nævus flammeus, qui latam maculam, striatam, quæ vini rubri quasi effusi colorem habet, refert.* Plenck, loc. cit., p. 37.

they are met with in association with single or multiple mothers' marks of other sorts, small or very large *nævi spili et pigmentosi*, in the same individual.

Course.

The course of the *nævi* varies in different cases. In some cases the macular *nævi* retain the size, form, and condition which they possess at birth, during the whole lifetime of the individual. At the utmost the colour may vary a little under the influence of great changes in the external temperature. Under the influence of mental excitement, or, according to certain authors, of menstruation, they may become more turgid. The elevated *nævi* more frequently show evident changes in their turgescient character, colour, and pulsation. They swell out during any increased vascular excitement, during screaming, crying, after meals, and during mental excitement. On the other hand, they become paler during any general anæmic condition of the skin, transitorily (during fainting), or permanently (owing to general cachexia). At another time a *nævus* may continuously or periodically increase in circumference for some time—months or years—after birth, until, at length, having arrived at a certain size, it then remains stationary. A continuous increase in size is much more common in the so-called *fungi hæmatodes* (of the older authors), the prominent *nævi*, than in the macular ones. They spread steadily, at one time superficially, at another time more deeply, and, in this way, not only gradually occupy large tracts of skin, but may spread superficially to the adjacent portions of mucous membrane, for example, from the lips to the gums, the mucous membrane of the lips and cheeks, the tongue, and the hard palate;* or from the eyelids to the conjunctiva, or, on the other hand, they may extend deeply into the subcutaneous tissue, or even, occasionally, to the muscles,† to the periosteum, or to the

* Schuh, 'Wiener med. Wochenschr.,' 1861, No. 48. It must also be mentioned that *Nævi vasculares* may, on the contrary, begin, primarily, on these portions of mucous membrane, and may spread thence outwards to the skin. See Virchow, loc. cit., p. 400.

† Billroth, 'Unters. ueber die Entwicklung der Blutgefäße,' Berlin 1856, p. 70.

nerve-sheaths.* In consequence of the steadily increasing vascular tumour, the adipose tissue, muscles, or even the subjacent bones, the humerus or phalanges, for example, may undergo atrophy in the course of years.

A nævus may even be observed to increase greatly in size after it has remained unaltered for many years. In this category we may place the cases of "tardy" angiomas (Virchow), which have been observed by various authors, and repeatedly by ourselves in adults. They occur at one time in the form of rather soft tumours, which are very easily compressible, and quickly swell out again, are of a bluish-red colour, irregular on the surface, here and there tubercular, and situated most frequently on the extremities. When dependent, they swell out to an enormous size, and, when elevated, diminish in size, owing to the gradual escape of the blood contained in them, until they may be no longer recognisable. At another time the tumours feel much firmer, and especially deep down in the subcutaneous tissue, like irregularly lobulated masses, and possess a more or less marked turgescient character—capability of swelling out and subsiding again. Occasionally these tumours may attain an enormous size. They have been described by Schuh as of two kinds, "Lobulated vascular tumour," and "Venous telangiectasis," though really they only represent variously localised and developed forms of the same malady. It is in connexion with them that the most advanced degree of atrophy of the muscles and bones occurs.

There is no doubt that occasionally it appears as if these vascular tumours met with in adults had become developed at a period long subsequent to birth. It must not be forgotten, however, that in some a nævus telangiectodes, which was present at birth, has undoubtedly afforded the starting-point from which the vascular tumour, observed later in life, has become developed. At another time, the vascular growth is known to have existed since a very early period, at least, of the patient's lifetime. A further explanation of the occurrence of such cases is afforded by the circumstance that nævi vasculares do not always commence in the skin, but not infrequently originate in the subcutaneous tissue (nævi subcutanei), extend there subcutaneously, and are, in this stage, overlooked, or do

* Schuh, loc. cit.

not come under the care of any medical man. It is only later, by continuous growth, that they involve the corium and the papillary layer. The first sign of their existence is the appearance of isolated, irregularly distributed, ampullous, bossy, soft, elastic, compressible, and turgescient elevations of a bluish colour on the surface of the skin. Gradually, their development, by more uniform extension, becomes apparent. By the touch, however, we can, at any time, demonstrate the existence of a very extensive mass in the subcutaneous tissue in connexion with the superficial vascular tumour.

Nevertheless, we do not wish to deny the possibility of the spontaneous development of one of the forms of angiomas described above, in adult life, independently of the previous existence of a cutaneous or subcutaneous nævus. According to the experience derived from the cases hitherto recorded, such an occurrence must, at any rate, be extremely infrequent.

Complications.

Nævi vasculares may undergo many changes during their course, in external appearance, character, import, and constitution, partly arising idiopathically in the structures themselves, and partly due to external influences. It is of the greatest importance to bear in mind that a turgescient vascular tumour may become developed in course of time from a macular nævus. This circumstance makes the latter of much graver import in regard to prognosis and treatment. The prominent nævi not unfrequently become excoriated on the surface from scratching with the finger-nail, pressure, or friction, and then symptoms of eczema may be developed, effusion of moisture, and the formation of crusts. On these parts, great hypertrophy of the papillary layer readily ensues, and fungous granulations form, causing the surface of the growth to assume the appearance of a malignant wart, or of a papilloma, for which it is often mistaken. Just as in other affections, under similar conditions, the superficial, luxuriant, papillary, and epithelial growth may pass into true epithelioma,* and thus a combination of a vascular

* Lücke in Virchow's Archiv, xxxiii. Bd., p. 333, und Pitha-Billroth's 'Lehrb. d. Chir.,' 2 Bd., 1 Abth., p. 263.

tumour, situated deeply, and an epithelioma, on the surface, may result.

Hæmorrhage may occur from nævi, either spontaneously or in consequence of wounds produced accidentally, or in course of treatment. The thin-walled, pouch-like, prominent portions met with singly on flat nævi, and in numbers on the prominent growths, are especially liable to give way. Occasionally it is a difficult matter to stop the hæmorrhage, but, at other times, it ceases of its own accord, owing to coagulation occurring spontaneously.

Inflammation and gangrene frequently make their appearance in the neighbourhood of a nævus, either spontaneously or from external causes, and may be of various import as regards the nævus itself, and also as regards the individual. At one time the nævus may undergo partial or complete involution, owing to inflammation, whether of an acute character or having a chronic, recurrent course, but especially in the latter case. At another time it may, on the contrary, spread peripherally and more deeply, in consequence of the inflammation, and assume a malignant character, as was previously mentioned.

Gangrene always results in the destruction of the nævus as far, at least, as it may happen to spread. Not infrequently nævi may in this way be "spontaneously" removed. In the course of the gangrenous ulceration, dangerous hæmorrhage may sometimes occur. The life of the patient may be seriously endangered, or a fatal result may ensue, owing to the latter, or to the gangrene itself and its accompanying manifestations.

In order to complete our description of the possible events of nævi vasculares, we have yet to mention that they may undergo spontaneous involution. This applies to the macular as well as to the cavernous nævi, to those which have existed unchanged from birth, as well as to those which, in after life, enlarged to a certain extent, or even became transformed from flat nævi into prominent, turgescient ones. Apart from the partial diminution and fading which the flat nævi vasculares may undergo, according to some authors, in advanced life, a partial or total and essentially complete involution of a nævus may result in various ways, without any artificial aid. At one time we may observe a gradual fading, ending in complete disappearance of the vascular injection in the course of months

and years, without any concomitant symptoms of any sort. The nævus has disappeared, and the skin retains its normal appearance, and feels normal when touched, or there remains only a deeper pigmentation. At another time a glistening, cicatricial-like, atrophied condition of the skin permanently results. Occasionally, on the contrary, the portion of skin affected becomes thickened, indurated, and deeply pigmented. A nævus has also been known to disappear spontaneously, in consequence of general anæmia, produced by some other malady. Amongst the modes in which nævi vasculares undergo spontaneous involution must also be mentioned that which results in consequence of inflammation and gangrene set up spontaneously, as has been previously described, within the vascular tumour itself. Nævi may also undergo atrophy in consequence of inflammation taking place at their periphery (that is, in the tissues surrounding them), and being followed by a formation of connective tissue, by which they become encapsuled. The latter modes of involution, accompanied by inflammatory processes, more frequently ensue in connexion with the cavernous nævi, and the former, which are unassociated with any such symptoms, more frequently concern the macular nævi. On the whole, however, it is very rarely that a nævus undergoes spontaneous involution.

Etiology.

Our knowledge, in regard to the causes which lead to the production of nævi, amounts to little more than mere supposition. Many, in special situations, have been shown to be connected with certain foetal conditions (Virchow über fissurale Angiome am Schädel, collare Angiome, &c.). If we consider them to be abnormalities of development, they only share, as regards the influences which have caused them, in the obscurity attaching to so many other kinds of abnormalities of development. The fact that their remarkable form and colour cause them to resemble many objects and animals may have given rise, in the first place, to the myths about "mental impressions in pregnant women,"* which are supposed to explain the origin of mothers' marks in general, and also of nævi vasculares. Though this belief will probably for long yet find support in popular estima-

* See p. 71.

tion, it does not now call for any notice in a work devoted to a scientific account of the subject. An hereditary tendency is extremely rarely demonstrable. According to the statistical calculations of some authors (Lebert, Schuh), nævus is more common in children of the female than of the male sex.

Prognosis.

No certain prognosis can be given immediately, nor within some time after birth, as to the future course of nævi vasculares. It is only after several months' careful observation that some estimate may be formed of their future course, and of the expediency of treatment, and the kind to be adopted.

The macular, flat nævi are, as a rule, to be considered the most hopeful. The most unpromising are those which, from the first, have a spongy feel and a turgescient character. This difference in reference to prognosis depends on the experience that the first kind of nævi more frequently remain permanently unaltered, whilst the latter kind more frequently enlarge subsequently in all directions. The simple nævi may, however, during the first few months or years of life, either increase in size, merely, or may even, here and there, take on the character of the cavernous nævi. The prognosis becomes, therefore, proportionately unfavourable, even for the flat nævi, and so much the worse as regards both kinds, the more quickly, continuously, and universally, that is, especially the more deeply, the increase in growth proceeds. The determination as to whether any or what sort of treatment should be adopted in any case of nævus, and the prospect of eventual success from it, must be dependent on observation of the constancy or of the conditions of growth of the nævus. If the nævus shows no tendency to increase in size, treatment may be suitably deferred for some time, at any rate till a more advanced period of the child's life, till it has attained sufficient strength, &c. Expectancy is all the more indicated under such circumstances, because, on the one hand, it cannot cause any injurious effect in any case, and, on the other hand, spontaneous involution of the nævus may result.

If treatment be adopted after a time it need not, at first, be of a very active character, but slighter remedies may be tried, first of all, and, ultimately, a successful result may be expected

from appropriate treatment. If we, however, observe that the nævus is growing rapidly, then we cannot begin too soon to treat it. That plan must be adopted which seems to promise the greatest certainty of success. To delay would only result in there being a larger tumour to treat later. Energetic and early treatment in such cases, however, is attended by less certainty of success than in nævi which are either not increasing in size or only slowly, because, in the first class of cases, the new growth is very often reproduced at the periphery of the part operated on. The prognosis is still less hopeful in the case of nævi which bleed frequently and spontaneously, because the patients become much reduced in consequence, and, also, especially after waiting for some time, are less favourable subjects for operation. The most doubtful prognosis of all must be given in those cases in which the surface of the nævus has assumed a fungoid, exuberant, or unmistakeably epitheliomatous character.

Anatomy.

The anatomical structure of nævi varies exceedingly according as we investigate the simple, macular nævi, or those which have an undoubted tumour-like, turgescient appearance. There are the most varied degrees of transition between the simplest and the most complicated. For this reason, the difficulties in the way of a purely anatomical classification and mode of mutually distinguishing the various forms of angiomata from one another are insurmountable.

Not even the simplest of the nævi in their anatomical structure, the macular forms, can be absolutely distinguished from the others, anatomically. For they show many transitions between, and combinations with, the turgescient forms, indeed they occasionally become wholly transformed, in course of time, into them. There is still more difficulty as regards the nævi which have an erectile character, for the latter causes them to resemble the cavernous tumour. In addition, however, a special kind of tumor cavernosus has been distinguished by authors (see No. 4). In fact, anatomists have not overcome this difficulty, and the less so because they themselves have not as yet arrived at any unanimous opinion as to the anatomical character of the tumor cavernosus. Rokitsansky defines the tumor cavernosus very

differently to Schuh, and Virchow to either. In particular, we find that Virchow describes angiomata as cavernous, in the sense of tumor cavernosus, which others do not admit as such, and Schuh's "lobulated vascular fungus" (loc. cit., p. 153) is classed by Virchow under Cavernous Angiomata, as well as his "cavernous vascular fungus" (loc. cit., p. 164) and his "venous telangiectasis" (ibid, p. 176). In fact, no absolute distinction can possibly be drawn in this way between the various kinds of vascular tumours. And, least of all, if Virchow's opinion is correct, that Rokitsansky's tumor cavernosus is due to dilatation of vessels, and does not originate—as Rokitsansky supposes—external to the vessels, as a distinct structure (see further on).

After what has been said, it cannot be wondered at that the results of the anatomical examination of the different kinds of cutaneous nævi are very similar. Anatomically, merely a greater or less development of new vessels can be distinguished. As, however, practically, the angiomata are distinguished from one another by their "history" and their clinical course, we have thought it advisable to subdivide them on this basis.

The simplest anatomical conditions of all are met with in the macular nævi vasculosi. They consist of dilated small blood-vessels, as, indeed, is quite evident from their clinical characters. The flat nævi are chiefly situated in the papillary layer, from the vascular stratum outwards. The supposition that the fine arteries predominate in the nævi which are of a brighter red colour, and the venous twigs in the livid ones, is probably correct, but has never been demonstrated in any case, and is not indispensably necessary. An actual growth of the vessel really occurs under all circumstances, even in the completely flat nævi, and the growth, in the slighter cases, affects, first of all, only the wall of the vessel, causing the latter to become longer and wider. The occurrence of varicosities in the vessel, in the form of isolated, thin-walled projections, is, therefore, easily comprehended. The new growth from the vascular trunks and their ramifications undoubtedly serves to explain the production of the prominent, nodular, and deeply spreading nævi vasculosi, such as those depicted by Lücke (Pitha-Billroth's 'Lehrb. d. Chirurgie,' loc. cit., nach Porta), and Billroth ('Vorlesungen über Geschwülste,' p. 46, fig. 92,

a and b), from injected preparations. The new formation may be regarded as an ectasis, associated with a growth of the vascular wall, and consists of primary, secondary, &c., dilatations, which again give rise to primary and secondary ectases. In this way vessels originate, which are very variously intertwined and convoluted, and arranged with reference to each other, and which, on the one hand, owing to the great number of enlarged channels filled with blood, account for the remarkable colour of the skin, and, on the other hand, by their bulk, cause the tumour-like appearance of the new growth. The latter seems to be composed of small and larger lobules, which (according to Billroth) are produced in this way, "that the very peculiarly limited vascular areas found in the cutis, in connexion with the sweat glands, hair follicles, sebaceous glands, and lobules of fat, all become affected independently of each other, and that the isolated, proliferating systems of vessels form the lobules already mentioned as visible to the naked eye." This proliferation is developed to the slightest extent in the macular nævus (N. flammeus). A further development is observed in those nævi which exhibit isolated projections on the surface. And it is met with in the highest degree in those which spread deeply and feel tuberosus and spongy on touching them. It is to be remembered that the convoluted vessels here form, almost exclusively, the structure of the new growth, whilst the contrary occurs in the case of the lobulated vascular tumours, in which connective tissue and fat are important factors in making up the bulk of the new growth.

In that part of the nævus which is situated in the subcutaneous tissue, that is, more especially, in the adipose layer, the proliferation of vessels is most conspicuous in the neighbourhood of the lobules of fat. This causes the growth to assume a lobulated and granular appearance. Schuh has been led by it to adopt the designation of "Lobulated Vascular Tumour" (loc. cit.). The fat-lobules in some parts disappear, owing to the proliferation of the vessels. In other places, they are well preserved, and these portions have induced authors to use the terms "Angioma Lipomatodes," "Lipogenes Angiom" (Virchow). It is evident that this does not constitute a special form of angioma any more than the designation "Phlebogenes

Angiom," for one which appears to consist almost exclusively of dilated and newly formed vessels.

The essential characters of the pathological formations of which we are treating are, that they are made up of vessels which occur in abnormal number, size, and mode of arrangement in a tissue which ordinarily only contains vessels, arranged in a particular manner, and capillaries; and that, owing to the continuous proliferation of the vessels, the affected tissue partially disappears, becoming amalgamated with the vascular tumour. In this sense *nævi* are destructive ("envahissant") structures. This character is most clearly marked in the turgescient, sponge-like, compressible and expanding *nævi*. They consist of a convoluted mass of vessels, both arteries and veins, principally the latter, intertwined confusedly, without any regular arrangement, and inosculating freely with one another. The cut surface conveys the impression of a sieve-like, perforated tissue, with larger and smaller openings, in addition to longitudinal sections of vascular channels similarly perforated. In isolated spots, there occur larger cavities, filled with blood, or empty, or containing phleboliths. The whole, therefore, has an appearance indicated by the term "cavernous," which satisfactorily explains the abundant supply of blood, the rapid distensibility, the more or less easy compressibility of the tumour, the occasional pulsation, &c. Some vessels show a remarkable thickening of their walls, and even of the muscular layer. Others have extremely thin walls. The latter statement applies especially to the bossy, vascular eminences on the surface of the skin, consisting of saccular dilatations or appendages of a vascular trunk. Here and there, the vessels are packed closely together, but, at other parts, they are separated from one another by a greater or lesser amount of connective tissue of old or recent formation, normal constituents of the corium, sweat glands, isolated sebaceous glands, and hair follicles. The *nævi cavernosi* merge gradually at their periphery into the surrounding healthy tissue, a few large, varicose, and some smaller vessels intervening. Occasionally, however, there exists, as a kind of boundary, perforated by a few vascular trunks, a dense, fibrous tissue, manifestly arising from secondary inflammatory processes. These forms of cavernous structures, developed from

simple *nævi* vasculosi, closely resemble the tumor cavernosus of some authors. Moreover, the various anatomical conditions here described may be combined together in the same *nævus*, just in the same way as the latter may combine the characters of the simple and of the turgescient *nævi* clinically.

The views held as to the nature of the process of the formation of the vessels constituting *nævi* vasculares, are the same as those given in explanation of the formation of vessels in general, and are various and partly antagonistic. The development of vessels out of cells arranged together in rows; sprouting in the form of club-shaped processes, solid at first, but subsequently becoming hollowed out, and communicating with the parent vessel; free formation of blood in previously existing spaces—views which we have stated in detail in the chapter on the formation of granulations (p. 300 of the present volume), and to which, therefore, we need not here further allude.

Treatment.

The very small *nævi*, which in form and size resemble the acquired telangiectases previously described, may be treated by the same simple measures which have been recommended in the case of the latter. As, however, the congenital *nævi* are not only frequently of considerable superficial extent, but also, as has been described, occasionally occur in the form of moderately elevated and deeply spreading tumours, abundantly supplied with blood, and possessing large cavities filled with blood, the simple procedures mentioned will, in such cases, be but seldom attended with success, and more active treatment must be adopted. This indication can be followed out in various ways.

1. The employment of local compression, and the local application of cold in the expectation that they will cause the dilated and newly formed vessels to contract and undergo involution. Both methods are inapplicable in certain situations, and though they are spoken of by some authors as efficacious, they are considered useless by most.

2. Ligature of some of the large afferent vessels, with a view of causing the vessels in the *nævus* supplied by them to shrink, may also be considered as useless. Ligature of the carotid, which has been practised by some surgeons for the

cure of nævi on the head, is, therefore, all the more to be condemned.

3. The injection of a weak solution of perchloride of iron (Ferrum sesquichlor. aq. font. āā), or a combination of iron and chloride of manganese,* or pure nitric acid (Lloyd)† into cavernous angiomata, has sometimes caused shrinking and sometimes sloughing of the vascular tumour. In the latter case considerable hæmorrhage has not infrequently followed the separation of the slough. The plan may also prove dangerous to life, and even fatal, owing to gangrenous disintegration of the tissues and pyæmia ensuing. Nævi situated on the cranium are especially dangerous in this respect, owing to their communicating with intracranial veins.

4. By thrusting red-hot needles‡ or a platinum wire, heated by the galvanic apparatus, into the nævus, the blood contained in the vessels may be coagulated. In the course of the process of shrinking, which results, the vessels become atrophied. In consequence of this treatment, which, in the case of large nævi, must be repeatedly renewed and applied only to portions at a time, a gradual subsidence, shrivelling, and whitening of the patch of skin affected by the nævus may be observed. Occasionally, however, a too intense caustic action, charring, and mummification of the tissue is produced, and the latter can then only be shed after a subsequent inflammatory and suppurative process. We must be quite alive to the danger of hæmorrhage occurring during the separation of the slough. A scar will remain after the part has healed over.

5. Destruction and partial shrinking may result after suppuration has been established, by the inoculation of the nævus in several places with vaccine lymph. Vaccination pustules become developed within the same period and in the same form as after vaccination on any other part. The inflammation at the base, however, and the suppuration extend rather more deeply. The nævus begins to slough at the parts inoculated, and ultimately separates altogether, leaving a scar behind, or parts of it may, here and there, become shrivelled.

* Lücke in Pitha-Billroth's 'Lehrb. d. Chir.,' 2 Bd., 1 Abth., p. 256.

† 'London Medical Gazette,' October 1836. Cit. Chelius, nach Virchow, loc. cit., p. 389 bereits 1828.

‡ Nussbaum, 'Bayer'sches ärztliches Intelligenzblatt,' 1861, No. 47.

6. Destruction of the nævus by means of caustics is occasionally indicated and easily accomplished. Small nævi of the size of peas or beans, fairly circumscribed and elevated above the surface, may be treated by the application of caustic potash or a stick of nitrate of silver. By this means the vessel or convolution of vessels, together with the contents and a portion of the surrounding tissue, is charred and converted into an eschar. A scar remains after the separation of the eschar. Some authors recommend that the nævi should, first of all, be superficially abraded by means of *Empl. cantharidum*, *Oleum croton tiglii*, &c., and that then chloride of zinc, chloro-bromine paste, caustic potash (Stromeyer in O. Weber, loc. cit.), chloro-acetic acid, hydrochloric acid, &c., should be applied. Cauterisation by means of arsenical paste, will also destroy nævi, but may cause the death of the patient, especially in young individuals, owing to poisoning from absorption of the arsenic.* Cauterisation by means of fuming nitric acid (sulphuric acid being less efficient) has been proved to succeed well, not only in the forms last mentioned, but, also, in the more extensive and tumour-like nævi. A little is taken up at intervals by means of a glass rod, or bit of wood, and the application is discontinued when the well-known yellow colour is produced. This mode of cauterisation is preferable, inasmuch as it does not set up suppuration, but, as a rule, causes the tissue to form a dry scab.† After from five to eight days the scab falls off, and the application of the caustic is repeated in the same way on all the other parts of the nævus until merely a flat, cicatricial depression remains everywhere instead of the nævus. The use of a salve of tartarised antimony (*Tart. emetici grana novem Empl. adhesivi drachmam*) has often been attended with success, according to Krieg‡ and

* 'Heidelberger klinische Annalen,' Bd. iii., p. 331, Bd. iv., p. 499. Hebra, on an analogous action of his paste of arsenic, creosote, and opium, in "a case in which an epithelioma of the cheek, of the size of a fist, which had developed from a lupus patch, was cured." 'W. med. Wochenschrift,' 1871. 'Separatabdruck,' p. 6.

See, also, Treatment of Lupus, further on.—Tr.

† Lloyd (1828) first practised injection of nitric acid into a nævus. What has been said as to the injection of perchloride of iron applies equally to this.

‡ Casper's 'Wochenschrift,' 1840, No. 52, p. 831.

Zeissl.* Success has also resulted from painting the nævus with collodion and corrosive sublimate, as formerly recommended by Wardrop,† and recently by Wilhelm Stricker‡ (four grains of sublimate to half a drachm of collodion).

7. A nævus may be removed more quickly by tying it. The smaller nævi, resembling blackberries, more or less stalked, and not penetrating deeply, may be strangled with thread, like warts. The tumour becomes gangrenous, as a result of the ligature. Frequently, however, a thorough cauterisation of the base of the tumour is subsequently necessary, because, otherwise, it may easily be reproduced. Sessile nævi of considerable size may be strangulated by transfixing or cutting round their base, and then tying them from the periphery towards the centre, or in two halves, beginning at the centre (method of White,§ Lawrence,|| Brodie¶).

8. Lastly, nævi may be removed by excision. The edges of the wound are immediately united by suture after the excision. It is necessary, also, to excise as much of the surrounding skin as shows any evidence of enlarged vessels in it, because experience has shown that the nævus frequently becomes reproduced peripherally. The limits of the excision will be indicated by local circumstances, and by the necessity of avoiding the production of an irreparable deformity, or one still greater than that caused by the malady itself.

The method of treatment to be preferred in dealing with any particular nævus will be dictated by the nature of the case, *i.e.*, the character and situation of the growth. It is merely necessary to mention that at an early period, and, therefore, in newly-born and young children, active treatment is only to be adopted when the growth shows a tendency to increase rapidly. If, on the contrary, the nævus remains stationary, it is better to postpone any active treatment, that is, a bloody operation, because the disease occasionally undergoes spontaneous involution, and the individual will be better able to bear an operation at a later period.

* 'Zeitschrift, d. k. k. Ges. d. Aerzte,' Wien, 1862, p. 70.

† 'Med. Chir. Trans.,' 1818, vol. ix., p. 213. Cit. Virchow, *loc. cit.*, p. 380.

‡ Virchow's Archiv, 41 Bd., 1867, p. 293.

§ 'Med. Chir. Trans.,' vol. xiii., P. ii., p. 444.

|| Ibid., p. 240.

¶ Ibid., vol. xv., P. i.

3. *Angio-Elephantiasis.*

A form of vascular new growth, which is characterised by the occurrence of extensive, soft, elastic, dependent tumours, embedded in an abundance of young connective tissue. Though described by several authors in essentially the same manner, this form of tumour has received very different designations. Thus, it has been designated by Rokitsansky,* *Tumor Cavernosus*, by Schuh,† “*Venous Telangiectasis*,” by Hecker,‡ a form of “*Elephantiasis Lepra Arabica*,” and, lastly, by Virchow,§ as *Elephantiasis Telangiectodes*. I, myself, have also fully dealt with the affection under the latter term, at p. 159 et. seq., in the present volume, and have there assigned reasons for thus grouping it with elephantiasis. Though I must refer to the description there given for an account of the symptoms, course, significance, anatomy, and treatment of the malady in question, yet, I also think it is necessary to make special mention of it here, for, as I have already pointed out (loc. cit.), the number of the vessels occasionally so preponderates over the quantity of the connective tissue in the tumours described, or in some parts of them, that the new growth of vessels is decidedly their most striking feature. Anatomically, these tumours at one time resemble, or are identical with, the lobulated vascular fungus of Schuh, and, at another time, the tumor cavernosus of Schuh and Rokitsansky. But in their course they invariably differ from the other vascular tumours. More especially by their spreading widely superficially, by their continuous growth, the atrophy of the subjacent and neighbouring muscles and bones, the accompanying neuralgia, the frequency with which they return, and, lastly, by the deleterious influence which they exert on the general organism.

4. *Tumor Cavernosus.*||

The tumor cavernosus is principally confined to internal organs, the liver, spleen, or kidneys. In the skin it occurs but

* loc. cit., p. 207, i. Bd.

† loc. cit., p. 177 et seq.

‡ loc. cit., Taf. 1, u. Text.

§ Geschw., i. Bd., p. 317.

|| See Rokitsansky, loc. cit., and Schuh, ‘*Pseudoplasmen*,’ Wien, 1854, p. 164 et seq.

seldom, and then is not primarily developed there. Its original starting-point in such cases is the subcutaneous cellular tissue. In this situation it becomes developed in the form of nodules, which are of the size of lentils, peas, or hazel-nuts, rarely of the size of walnuts, rounded or oval in shape, mostly very firm, but occasionally rather elastic to the touch, capable of being grasped by the fingers, and covered by skin, which is quite supple and in a normal condition. At this time, therefore, the nodules are not visible, but only perceptible by the touch. They are but slightly movable, as they are mostly attached, at some part of their circumference, to a neighbouring vein or tendinous sheath, the fascia, or the periosteum. Some, however, are situated more deeply underneath the tendons, or beneath the fascia.

They are most frequently met with in the neighbourhood of the saphenous or the cephalic vein, and, therefore, on the inner surface of the lower extremity or of the upper arm, more rarely on the neck, on the shoulder, or on the face. They increase in size very slowly, and do not become larger than a walnut, as mentioned before. They, however, encroach on the cutis directly, if they originate in the superficial part of the subcutaneous tissue. The skin, which at first is quite normal in colour and in general condition, becomes bluish in patches, owing to vascular ectasia occurring in it, later it is more uniformly and deeply tinted of a bluish-red colour, becomes united to the subjacent tumour, and cannot any longer be pinched up from it. Its surface becomes irregular. In course of time, papillary, cock's-comb-like excrescences, which give exit to a discharge, or are covered with thick, discoloured, and fissured epidermis, are developed on it. The erectile character of the tumour is often very easily recognised in this condition, and is especially evident when the affected part of the body is in a dependent position. The consistence of the tumour occasionally becomes semi-elastic at this stage, even when it had previously been very firm. The tumour is painful, both on pressure and spontaneously, and the pain occasionally radiates in various directions. This applies especially to the cases in which the tumours are situated in the neighbourhood of the subcutaneous veins named, near which nerve-trunks run. The growth generally occurs singly, but in rare cases there may be many and even large numbers scattered over the body.

The tumor cavernosus is considered by Rokitansky* and Schuht† to be of an innocent character, though Rokitansky mentions one case in which it existed in combination with carcinoma.‡ It grows very slowly, and does not attain a larger size than that of a walnut, even after it has existed for twenty years, and does not exercise any injurious influence on the general condition of the patient.

It can be enucleated, and does not return.

Diagnosis.

The tumor cavernosus can be distinguished from the cavernous nævi, and especially from the lobulated vascular tumours and the venous telangiectases of Schuh, by its growing very slowly, and never attaining any large size, and by its being encapsuled, whilst the latter grow rapidly and indefinitely, and are diffused. Without the aid of a prolonged observation of the case, however, it is occasionally very difficult to arrive at any diagnosis. The cavernous tumours which are visible on the surface have the same physical peculiarities as the cavernous and bulky nævi. And whilst they are situated in the subcutaneous cellular tissue, it is hardly possible to distinguish them from lipomata or fibromata. The difficulties which have been alluded to in the diagnosis of the tumor cavernosus are not lessened by a consideration of the anatomical conditions.

Anatomy.

Plenck described the essential anatomical characters of the cavernous vascular tumour pretty fairly when he said,§ “*est excrescentia cutanea rubri vel lividi coloris, quæ ex tela cellulosa in substantiam cavernosam mutata constat, et sanguinem, vel succum gelatinosum in cavernulis suis continet.*” The results of the examinations hitherto made, by Joh. Meckel,|| Andral,¶

* ‘Path. Anat.’ i. Bd., 1855, p. 208.

† loc. cit., p. 174.

‡ Rokitansky on the development of the framework of cancer, and also the nature and development of other meshworks. Sitzungsber. d. k. Ak. d. W., 1852, März., p. 16.

§ loc. cit., p. 37.

|| ‘Handb. d. path. anat.’ Leipzig, 1818, ii. Bd., p. 288.

¶ ‘Précis d’Anat. pathologique,’ Paris, 1829, Tom. ii., 1, p. 401.

Rokitansky,* Schuh,† Wedl,‡ Virchow,§ Busch||, Esmarch,¶ Billroth,** and many other anatomists, have, in many respects, clearly shown the conditions present, but have not succeeded in reconciling views which, on other points, differ essentially.

The tumor cavernosus consists of a mesh- or frame-work,†† enclosing larger and smaller cavities, which communicate with one another, or are quite shut off from the rest. The latter contain fluid or coagulated blood, or so-called phleboliths. Rarely there are also a few cystic cavities with gelatinous contents. The walls which enclose the separate cavities are filiform, trabecular or lamellated, of varying degrees of thickness, and have a very finely or a coarsely fibrillated appearance. They are made up of fibrillated connective tissue and elastic fibres, containing also, occasionally, well developed muscular elements, or they may have a hyaline appearance, or consist chiefly of cells. The coarser trabeculæ and lamellæ also contain vessels (vasa vasorum, Wedl). Their inner surface is covered with a sort of endothelium (Busch, Esmarch, Rokitansky, Virchow, Fleischl). In the interior of the tumour are the openings of large and small veins, which have a straight course, or are varicose here and there, and frequently have large saccular dilatations, and there are also arteries. Nerves have also been demonstrated (by Schuh and Esmarch).

So far the statements of almost all authors practically agree with each other. The essential similarity in structure to that of the well-known physiological erectile structures (corpus cavernosum penis) justifies the designation "Cavernous" applied to these pathological structures.

As regards the explanation of the genesis of the tumor cavernosus, however, two opposite opinions are held, the cham-

* 'Path. Anat.,' 1855, i., p. 205 et seq.

† 'Pseudoplasmen,' 1854, p. 164 et seq.

‡ Sitzungsber. d. k. Akad. d. W., liii. Bd., 'Beiträge zur Pathol. d. Blutgefäße,' iii. Abth., p. 28.

§ Geschwülste, iii. Bd., p. 321 et seq. See also, *ibid.*, a copious Bibliography.

|| De nexu inter hygromata cystica congenita, tumores cavernosos et cystides sanguinolentas intercedente, Bonn, 1856, and 'Chir. Beobachtungen,' Berlin, 1854, p. 217.

¶ Virchow's Archiv, vi. Bd.

** 'Vorles. über Geschwülste,' p. 47.

†† See, especially, Rokitansky, *loc. cit.*

pions of which are Rokitsansky (Schuh, Esmarch, Busch), on the one hand, and Virchow on the other. Rokitsansky maintains that the tumor cavernosus is developed from the connective-tissue framework of the affected organ (and, therefore, of the skin) as an independent structure alongside of, but external to the vessels. Owing to outgrowth of the connective tissue in the form of dendritic vegetations and structureless, hollow, club-shaped processes, the framework is produced. The vegetations reach the blood-vessels and penetrate through their walls into the lumina. In this way a secondary communication becomes established with the blood-vessels, whose contents (blood) escape into the meshwork of the new growth, which originally had no connexion with the vessels. Moreover, Schuh, in support of Rokitsansky, expressly advocates the independent formation of blood within the structureless, hollow, club-shaped processes,* a view against which Virchow strongly protests. In addition to the above anatomical conditions, an influential argument in favour of Rokitsansky's view is found in the occurrence of similar isolated "young" tumours with hollow spaces, which are still unconnected with the blood-vessels, and therefore do not contain blood in their interior. Rokitsansky, therefore, regards the tumor cavernosus as an independent pathological structure, unconnected originally with the vascular system.

Virchow,† on the contrary, considers the cavernous tumour to be essentially a vascular tumour. In it may be distinguished, first, a new growth and cavernous dilatation of the existing old vessels, and of the newly-formed ones, which latter are developed (partly from the old vessels and partly) from the proliferating connective tissue; and, secondly, the formation of a fibrous structure, which encapsules the cavernous vascular tumour at the periphery. The formation of the encapsulating tissue takes place secondarily, and is the result of new growth set up by irritation or inflammation of the surrounding connective tissue. The peripheral capsule is penetrated by both arteries and veins, which are afferent and efferent. This can be shown anatomically and by injection. The blood circulates through these tumours just as in the physiological erectile structures. The arteries

* See, on the independent formation of blood, p. 300 of the present vol.

† Vid. loc. cit., p. 331 et seq.

convey the blood to them and the veins carry it away. He cannot admit that there is any blood contained in the hollow spaces which could have come there independently of the circulation, because he has never met with any tumour containing blood which was unconnected with the vascular system. He cannot accept the view that blood is formed independently in hollow cavities, because none of the characteristics of newly formed blood can be detected in the blood-corpuscles found in them, and it is especially noteworthy that white corpuscles occur in just the same way as in the blood-stream of the general circulation. Virchow, therefore, considers the tumor cavernosus merely a cavernous vascular tumour (*Angioma cavernosum*) with a fibrous capsule, which is formed secondarily, and that it does not differ essentially from a diffused cavernous angioma. The capsule offers, in some measure, an impediment to a diffuse extension, and, therefore, some remain of small size if they become encapsulated at an early period. Virchow consequently distinguishes between *Angioma circumscriptum*, *s. incapsulatum*, and *Angioma cavernosum diffusum*.

Rindfleisch's* opinion, that the tumor cavernosus arises in consequence of a preceding cellular infiltration of the connective tissue surrounding the cutaneous capillaries, leading to the production of a cicatricial retractile fibrous tissue, which, owing to its retraction, causes a mechanical dilatation of the vessels ensheathed by it, appears to form a connecting link between the views of Rokitansky and Virchow, but does not, however, materially reconcile them. In fact, the question of the mode of formation has not been definitely settled.

Recently, Fleisch† has maintained the correctness of Rokitansky's views as to the tumor cavernosus, on the ground of some injections which he has performed.

In separating the tumor cavernosus from *nævi* as a distinct structure, we have, without regard to the disputed anatomical conditions, been chiefly influenced by the clinical characters, mentioned above, which differ in many points from those of *nævi*.

* 'Lehrb. der pathol. Geweblehre,' Leipzig, 1871, p. 121. New Syd. Soc. Transl., vol. i., p. 162.

† Sitzung. der k. k. Ges. d. Ärzte in Wien, v., 21st December, 1871.

Prognosis.—Treatment.

So long as the tumor cavernosus does not cause particular inconvenience owing to its size, situation, the frequent hæmorrhage from it, its painfulness (neuralgia), or its multiple extension, it need not be interfered with. Under such circumstances it entails no ill effects, and may eventually undergo spontaneous involution, owing to calcification of its contents and atrophy of the vessels. If, however, owing to any of the circumstances mentioned, an indication is afforded for treatment, it can only be fulfilled by the excision of the tumour. This can be done without any difficulty, owing to the circumscribed character of the growth, and without any well-founded fear of any recurrence taking place.

CHAPTER LII.

(CLASS VIII.—DIV. II.—CONTINUED.)

NEW GROWTHS COMPOSED OF LYMPHATIC VESSELS.

LYMPHANGIOMA TUBEROSUM MULTIPLEX.

WE designate by the term *Lymphangioma tuberosum multiplex*, a peculiar form of disease of the skin which has not hitherto been described by any other author, and of which we have only seen one case.

The patient was an unmarried woman,* 32 years of age, who had previously enjoyed good health, and who was under care in the department for Skin Diseases from November 23rd, 1867, till February 11th, 1868. Scattered everywhere over the trunk, from the pelvic region to the submaxillary region and the back of the neck, as far as the hairy scalp, were hundreds of tubercles of the size of lentils or somewhat smaller, rounded, brownish-red, rather glistening, smooth, not scaly, flat or moderately elevated above the level of the skin. They became pale on pressure with the finger, and were recognised by the touch as firm, elastic, rounded structures, without distinct limits laterally. Imbedded in the corium, and only to be grasped in conjunction with it, they projected into the subcutaneous cellular tissue beneath, and superficially they formed the nodular cutaneous elevations mentioned. The tubercles were distributed with tolerable uniformity but without any special arrangement, and were only here and there, owing to their great abundance, collected together into small, irregular groups. In places, there were also three or more arranged together in a curve. They were slightly painful on pressure.

The appearance of the disease very much resembled that of a copious, lentil-shaped syphilide. On close inspection it

* Förster Theresia.

differed from the latter in the absence of any sharp limitation of the individual papules, which gave rise to the appearance of an efflorescence, in there being a central elevation to each tubercle instead of a depression, and in the absence of any apparent indication whatever of any partial involution of the tubercles taking place, *i.e.*, in the total absence of the formation of scales or crusts, or of atrophic or cicatricial depressions. On the contrary, the epidermis everywhere appeared uniformly smooth, and the skin itself was wholly unaltered, with the exception of the elevation and congestion, or the existence of a few dilated vessels on the lentil-shaped tubercles. It was diagnosed as a multiple, tubercular, cutaneous new growth.

The patient stated that she had had these firm, red tubercles on the affected parts since childhood. For years she had not noticed any change in them, neither had they become more numerous. For three or four years previously, however, they had increased in number, but the earlier ones had not undergone any change.

The patient was well nourished and her general health was not impaired.

Anatomy.

I excised a tubercle, from the left side of the front of the chest, which was examined microscopically by Biesiadecki (at

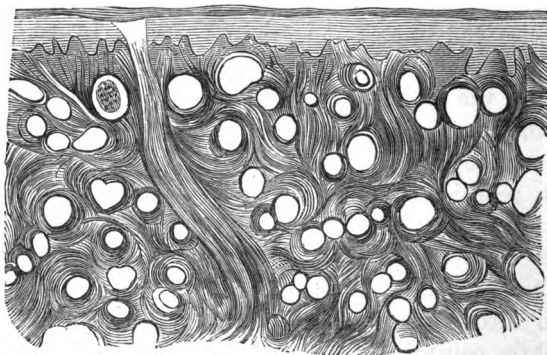


FIG. 1.—Lymphangioma cutis—vertical section. Hartnack, ocular 3, obj. 4.

that time an assistant in the Path. Anat. Institute) and myself. The result was as follows :

In vertical sections the corium appeared perforated in many places like a sieve. The apertures were less numerous in the upper and more numerous in the deeper layers of the corium. In shape they were circular, oval, or irregularly rounded. In diameter they varied from 0.02mm. (.0008") to 0.09mm. (.0036"). In some of them the circular contour was not complete, owing to there being a slit-like interval at one part, from the extremities of which passed two converging lines which joined at a longer or shorter distance, and thus enclosed a slit-like, empty

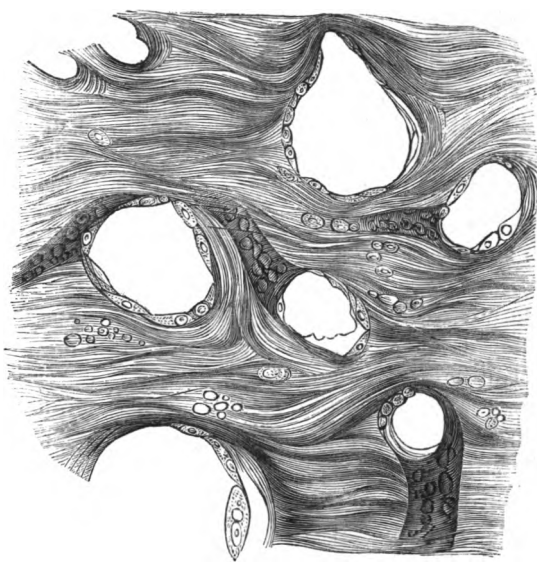


FIG. 2.—The same. Ocular 3, obj. 8.

space of corresponding size. The latter, therefore, appeared as a canalicular prolongation of the circular aperture. In others, the two lines, stretching away from the circular margin and having a parallel course for a certain distance, were connected by transverse, nucleated fibres, giving rise to the impression, in conjunction with the punched out contour, that the walls and channel of a vessel had been cut across very obliquely. The rounded apertures were, in some places, isolated, in others, two or three were situated close together or even opened into one another. These intercommunicating spaces and slits were not of equal

calibre. Small ones, scarcely a millimetre (.04") in size, were placed wall to wall against others which were twice or thrice as large, or they opened into one another. All of them, however, had a distinct limiting wall, of considerable thickness and rigid, unyielding appearance. On strictly transverse sections, moreover, the walls of the individual apertures were of such breadth that an inner and outer margin could easily be recognised. In the intervening space were imbedded large, highly refracting nuclei, easily stained with carmine, and arranged regularly in a circular manner around the aperture. The inner wall was covered all round with a layer of nucleated cells (endothelium) which projected irregularly from its surface. By careful focussing it became quite certain that the apertures corresponded to sections of canals. By focussing superficially, an upper, rounded contour was apparent; by gradually focussing deeper, it became evident that there was a second, more deeply placed, circular outline, which, in comparison with the upper one, was somewhat displaced, eccentric, and had a shorter diameter, and that the inner margin of the upper circle was connected to the border of the more deeply placed circle by a smooth, glistening membrane. It was clear that these were transverse and oblique sections of canals, which, according to the direction of the section, sometimes consisted of only short, cylindrical canals (apertures), and sometimes of deep, funnel-shaped, and in others, elongated, slit-like spaces, and frequently the external wall itself remained visible in the field for some distance, as is evident from figs. 1 and 2, without any further explanation. The spaces above described and the sections of canals were everywhere empty. In only a few were there any formed elements resembling white blood-corpuscles lying free.

At one part of a preparation now before me I see a structure limited on either side by parallel lines running in a curved direction, which is comparable in every respect, under the magnifying power used, to a section of an artery of medium size, and which must be regarded as a section of the outer wall of a tube divided longitudinally. The tissue round about the circular, funnel-shaped, and slit-like spaces and canals appeared little altered. In their immediate neighbourhood the connective tissue was arranged in denser bundles, and more concentrically, and there were imbedded in it an unusual number of connective-

tissue corpuscles, and cells with large, highly refracting nuclei were scattered through it. Moreover, there were groups or foci of such cells, at a distance from the sections of vessels, above described, distributed in almost normal corium tissue. I have not found any hair follicles, sebaceous or sweat glands in any of the preparations in my possession, nor any lobules of fat-cells. The blood-vessels appeared to be of normal size, and their walls unaltered. They were filled with red and white blood-corpuscles over large tracts. In the adventitious space connected with them, as well as scattered throughout the bundles of connective tissue accompanying them, were a number of cells, each of which had a large, highly refracting, spherical nucleus. The papillary layer and the epidermis appeared normal. The deeper layers of the latter were highly pigmented.

The spaces above described, which were scattered throughout the corium, and especially its deeper layers, could, without any doubt, be diagnosed as sections, in various directions, of vascular canals. The surest evidence in favour of this diagnosis is the well-defined limitation by means of continuous, smooth, glistening walls (*intima*), and the distinct border externally.

Moreover, we are led to consider these spaces, acknowledged to be vessels, as lymphatics. We are induced to form this opinion from the shape of the lumina of the vessels, which are not uniformly cylindrical, but somewhat irregular or varicose, and from the structure of the wall, which evidently appears to consist of an *intima*, of a *media* composed of muscular fibres, and of an *adventitia*,* strengthened by the adjacent connective tissue, arranged in dense concentric bundles, and lined on its inner surface by a distinct endothelium. Though the anatomical structure of the vascular wall just mentioned agrees with that of the wall of a vein, we believe that the vessels in question must not be considered as veins, but as lymphatics. More especially because we have never found any red blood-corpuscles in their interior, because the wall everywhere showed the thickness in diameter and the rigid condition described, and because we found the blood-vessels themselves which were present to be

* See, further, von Recklinghausen in Stricker's 'Geweblehre,' Leipzig, 1869, ii. Lieferung, p. 215. New Syd. Soc. Transl., vol. i.

quite normal. As, however, no such large, thick-walled, and immensely developed lymphatics exist in the corium normally, we must regard the lymphatics which existed in the cases described as a new and pathological formation. They formed convolutions which displaced the upper layers of the corium and the papillary layer by their bulk, and became visible, and could be felt externally as tubercles.

Prognosis.

In the single case observed, the new growth had developed without any known cause, and, without being attended by any evident symptoms, had undergone no marked change for many years, and, in spite of its subsequent increase and general diffusion, had neither caused any subjective pains, nor exercised any prejudicial influence on the patient's general condition. We must, therefore, consider the *Lymphangioma tuberosum multiplex* as an innocent new growth. We cannot, however, give any favourable prognosis from our experience of the case under observation, as the growth has not shown any tendency to involution, either spontaneously or as the effect of any known treatment.*

Lymphangiomata, that is, tumours which are chiefly composed of lymphatics, have been repeatedly observed in other forms and in other situations.† The greater number of those correspond rather to ectasiæ of the larger physiological lymphatics and cystic degeneration of normally situated lymphatic glands (Busch (*Lymphaneurysma*), Amussat and Breschet, Nélaton and Aubry, Trélat, Heschl, Fetzner, Petters, Virchow, Billroth). In the latter case the lymphatic glands in the inguinal

* The patient during her sojourn in the Clinique for Skin Diseases, from November 23rd, 1867, till February 11th, 1868, made forty-three inunctions of a scruple of grey ointment, took carbolic pills and iron and aloes pills internally, without the slightest good effect having been produced on the cutaneous malady.

† See, on this subject: Virchow, *Geschw.*, iii. B., p. 487 et seq., 1867, and the paper "on lymphorrhœa and lymphangioma," by Dr. Vladan Gjorgjevic, *Separatabdruck aus v. Langenbeck's 'Archiv für klinische Chirurgie,' Bd. xii., Heft ii., 1870, p. 41 et sequ.*

region, for instance, had become converted into large, fluctuating, cystoid pouches containing lymph. The case of Makrochilie, published by Billroth,* is most closely allied anatomically, inasmuch as the cavernous lymphatic tumour projected from the subcutaneous connective tissue into the skin. But the walls of the lymph-spaces were in this case made up of trabeculæ of connective tissue, and of muscular fibres, whilst in our case well-developed, thick-walled (firm, fibrous, vascular walls), and regularly-shaped, vascular tubes were present. Moreover, the new growth described by us is peculiar in its being situated in the corium itself, and in its multiple character, or, rather, universality. It is also distinguished by these characters from certain, sometimes congenital and sometimes acquired partial indurations of the face, lips, and other regions of the body, which have been designated as Lymphangiomata,† and also from those cystic tumours which have been declared to be cavernous lymphangiomata.‡

* 'Beiträge zur pathol. Histologie,' 1858, p. 218.

† See Virchow, *Geschwülste*, loc. cit., Billroth, loc. cit., Passauer, *Virchow's Archiv*, 37 Bd., 1866, p. 410, and Taf. viii. I have just seen a similar tumour to that described by Passauer, loc. cit., on the right cheek of a child nine months old.

‡ Reichel and Waldeyer on a congenital Lymphangioma cavernosum cysticum in a child one year and five months old. *Virchow's Archiv*, 46 Bd., p. 495.

ALPHABETICAL LIST

Of Diseases treated of in the first Three Volumes, for present convenience. A full Index will be given at the conclusion of the work.

*** Explanations of complex and unusual formulæ will be found in the first two volumes, under the treatment of the various diseases.

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